THE ROLE OF AGRO-BASED INDUSTRIES IN RURAL DEVELOPMENT, A CASE STUDY OF NYANSIONGO TEA FACTORY IN BORABU DIVISION, NYAMIRA DISTRICT.

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DECLARATION

This is my original work and has not been presented for a degree in any other University for examination.

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DEDICATION

This thesis is dedicated first to my beloved son, Samwel Nyaata for being a close academic partner throughout the masters course; second, to my beloved late father, Samwel Machini for his untiring love and support since childhood and mother Rachael Moraa who has been a constant source of love, support and encouragement especially through prayers. May God bless them.

ABSTRACT

Agriculture continues to play a significant role in rural landscapes, hence a basis for rural development. Agro-based industries which thrive on this major rural economic activity are an important aspect in rural development too. Tea industry, a major agro-based industry in Kenya, was selected to examine its role in the development of Borabu division as a case study. Borabu division presents a different picture from the rest of the district because it is a resettlement area. In addition , it presents the least population density. The problem concerns the fact that the division's resource potential is high but their utilization is relatively low.

Tea is a high value cash crop and as far as its production is concerned, it is very low compared to the region's potentials. Coupled with the population growth rate of 2.16 per cent, there would be a considerable strain on the rich agricultural base, a factor that could jeopardize future developments.

The tea industry in Borabu was studied with the main objective of examining its role in the development of the division. In order to address this objective, the study examined the backward and forward linkages of the tea industry within the division, the expenditure patterns of tea farmers and therefore how they contribute to development, examined the problems facing the industry along the linkage columns and points and finally suggested on how the industry could be planned to contribute more to the development of the division and rural areas in general. Data was collected from tea farmers, factory workers, businessmen, administrators and some key respondents.

Borabu division is facing increasing population due to natural increase and high immigration rates. The division has not been able to fully attain the government policy targets on tea development with regard to efficient leaf production and transportation. The division experiences insufficient labour, low production of tea, inefficient management, poor market prices on tea, poor infrastructure in some parts. All these present the weaknesses identified within the linkage pattern of the industry.

A number of lessons emerged from the study. That there is need to improve the production of tea at the farm level. This is envisaged to be achievable through encouraging the tea farmers to plant more tea, encourage non-tea farmers to grow the crop and improve the tea husbandry practices. Secondly, there is need to improve the efficiency and timely delivery of green leaf tea to buying centres and to the factory through an improvement of the roads, improving the collection of tea leaves from buying centres and by ensuring a reduction in distance covered. Thirdly, it is crucial that labour supply is sufficient and its performance efficient. In order to boost the farmers' attitude to the crop, market prices on manufactured tea should be improved. This can only be attained by improving the workers' and farmers' efficiency so as to realize more quality tea which can fetch higher market prices. All these can not be attained unless there is a well organized management system to overlook all the activities.

These suggestions are geared towards improving the role of the tea industry in the division in terms of improving the income levels, creating more employment

opportunities as well as inducing other multiplier effects of the crop which are able to contribute further to the development of the areas concerned. This is hoped to contribute specifically to rural development through enhancing the competitiveness of rural areas like Borabu in economic development and through provision of opportunities for rural people to enjoy a standard of living comparable to national standards.

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LIST OF ABBREVIATIONS

K.T.D.A.	Kenya Tea Development Authority
K.T.D.A. Ltd	Kenya Tea Development Agency Limited
R.T.P.C.	Rural Trade and Production Centres
ACC.	Accounting
Mkt.	Market
F.A.O.	Food Agricultural Organisation
I.F.A.D.	International Federation of Agricultural Development
U.N.D.P.	United Nations Development Programme
M.I.S.	Managerial Information Systems

Fin.	Finance
Qlty Ctrl	Quality Control

CHAPTER ONE

INTRODUCTION

1.O INTRODUCTION

Agriculture has been a persistent feature of man's evolution. In different parts of the world, different types of crops and systems have always been practiced in adaptation to prevailing cultural conditions and environmental factors. The role of agriculture in the development of developing countries and in Kenya in particular cannot be underscored as it affects all other sectors of the economy. It accounts for 30 percent of the Gross Domestic product (GDP), employs 80 per cent of the Kenyan population and accounts for 70 per cent of the export earnings. It generates the bulk of the country's food requirements and provides a significant proportion of raw materials for agro-based industries. (Welfare Monitoring Survey II, 1994).

However, with progressive increase in population coupled with acute demand for land, it has become increasingly evident that previously large and medium-sized farms are rapidly diminishing in size due to land sub-division. Hence the gradual shift from large-scale to small-scale agriculture. Considering the increasing role played by agriculture in the economy, there is need for a proper and efficient planning for the sector in order to allow for full and better functioning of different sectors of the economy.

Agriculture in Kenya is practiced along two main lines, crop production and livestock rearing. The latter is further practiced along large scale, such as ranching schemes, as well as small scale as in the case of small scale farmers keeping up to one cow or two.

Crop production is also practiced along large scale plantation farming and small scale farming.

Tea, the leading export crop in Kenya today, was first introduced in Kenya in 1903 at Limuru near Nairobi. It was not until 1920 that it was planted as a commercial crop. At that time, it was grown in big estates of more than 202.5 hectares exclusively owned by European settler farmers. Before 1950, Africans were legally prohibited from growing tea. A pilot survey done in Nyeri district saw the beginning of tea growing on African smallholder scale and was promising. Since then, smallholder scheme has been especially successful and is credited for putting the country firmly on the international tea scene. It nationally accounted for 24 per cent of the total Kenyan tea production and 50 percent in 1972 (Kangi, 1973).

1.0.1 Rural development before 1980:

The term rural development and its meaning has been evolving over time in response to changing social, economic and environmental conditions. World Bank (1975) defined rural development as a strategy designed to improve the economic and social life of a special group of people – the rural poor. It involves the extending of benefits of development to the poorest among those who seek a livelihood in the rural areas. This group includes small-scale farmers, tenants and the landless. At that time, rural development came to be known as 'growth with justice' or 'redistribution of additional incomes and not a basic restructuring of the production system.

A careful look at the rural economy of most African countries suggests that almost everything is wrong – disease is widespread, health services poor, agricultural output

low, roads are few, merchants and money-lenders are exploiting farmers, land-ownership skewed and administration is unimaginable. While this view may reflect some ethnocentricism, it is obvious that all these things are somehow interconnected and there is a need to tackle them simultaneaously, hence the integrated rural development strategy whose objectives were:-

- To improve the living standards or the well being of the mass of the people by ensuring that they have security and their basic needs such as food, shelter, clothing and employment are met.
- To make the rural areas more productive and less vulnerable to natural hazards, poverty and exploitation and to give them a mutually beneficial relationship with other parts of the regional, national and international economy.
- To ensure that any development is self-sustaining and involves the mass of the people.
- To ensure as much local autonomy and as little disruption to traditional custom as possible.

Lele (1975) in his book, 'The Design of Rural Development' defines rural development as improving the living standards of the mass of the low income population residing in rural areas and making the process of their development self-sustaining. Improving the living standards of the low income population involves mobilisation and allocation of resources so as to make services available to the subsistence rural sector. Mass participation involves the allocation of resources to low income regions and classes and that the productive and social services actually reach them. Making the process self-sustaining involves development of appropriate skills and implementing capacity and presence of institutions at the local, regional and

national levels to ensure the effective use of existing resources and foster the mobilisation of additional financial and human resources for continued development of the subsistence sector.

Rural development at that time was therefore driven by several factors. First, about two-thirds of the population in developing countries lived in rural areas. The rate of growth of these populations has increased in recent years. If these people had to have raised levels of life-sustenance, human dignity and freedom, income and employment opportunities had to be generated in rural areas so as to exploit the labour in situ. Secondly, despite substantial and impressive increases in growth of agricultural and food outputs in a number of developing countries, the plight of the landless labourers and small farmers had not been improved significantly (Griffin, 1974). This was achieved by provision and use of yield-raising inputs and technology by those with the ability, information and political power to demand these things. Therefore, in the absence of any significant land reform, poverty for those without land was closely related to the concentration of land in the hands of large farmers and land owners. Thirdly, rural development aimed at reducing destruction and unemployment. That the unemployed rural people would get employed in the development of rural areas.

1.0.2 Rural development today

Rural development today is not different from what it was in the past only that it has built on the past. In a broader perspective, integrated rural development considers the inter-relationships among all the factors that contribute to the well-being of the rural people (Chant, 1989). Rural development per se is a major strategy adopted by

various governments to transform rural areas and bring them to the mainstream of the national economy (Kamuyi, 1987).

The Rural development policy today focuses on areas that face challenges posed by globalization, increased competition, need to improve and safeguard environmental conditions, unemployment and a stagnating economy (OECD, 1996). For most countries, rural areas represent a large share of the enviromentally healthy rural areas, are an indispensable component of balanced national economic growth. If the economy is to effectively exploit its potential and ensure the well-being of both the rural people and other citizens is to be assured, there is need for a balanced economic growth.

Therefore, the aims of rural development may be summarized as follows: (OECD, 1996).

- To enhance the competitiveness of the rural areas so as to maximize their contribution to economic development.
- To provide opportunities for rural citizens to enjoy a standard of living comparable to national norms.
- To conserve and develop the national environment and cultural heritage of rural areas.
- To consider and value the role of women in development.
- To be area-specific in approach.
- To enhance information technology in development.

1.0.3 Agro-based industries and rural development:

As mentioned earlier on, agriculture provides or supplies raw materials to many Kenyan industries. Agriculture in itself is a primary industry which extracts from the natural resources of our environment such as soils and rainfall. Agro-based industries are therefore those that receive their raw materials from agriculture. Examples in Kenya include sugar processing, coffee processing, milk processing and meat processing industries such as the Kenya Meat Commission.

Since independence, Kenya has put in place various development policies which she has or has not lived to implement. In the early 1970s, Kenya adopted the policy to balance development between rural and urban areas of Kenya. At this time, urban areas were developing at a much faster rate than the rural areas. This policy was to be articulated in the rural-urban balance strategy adopted in 1983. This was to be realized through the growth centre policy and later focused on the establishment of Rural Trade and Production Centres (RTPCs) (Government of Kenya, 1986), with improved linkages between urban centres and their rural resource production hinterlands.

1.0.3.1 Growth Centre Policy:

Growth centre policy was introduced in Kenya in the early 1970s to facilitate attainment of balanced regional economic growth. This policy was introduced in 1974 when there was a dual economy structure whereby development and opportunities for development were concentrated in the then major growth poles of Nairobi and Mombasa. In order to achieve a balanced regional economic growth, Kenya decided to decentralize development into new smaller growth centres distributed all over the

country. Therefore, several new growth centres such as Nakuru, Eldoret, Kakamega, Embu, Nyeri, Garissa, Meru, Thika among others were selected and designated as principal towns. Mostly, the provincial capitals and existing industrial centres. Below these principal towns were district centres with growth potential. These included Bungoma, Kisii, Kericho, Malindi, Nanyuki, Isiolo,Machakos among others. It was government policy to give priority to direct infrastructure and industrial investment into these growth centres to stimulate development within their rural hinterlands. Therefore, many agro-based industries were established within many of these towns. Other agro-based industries were established in the rural hinterlands of these designated growth centres owing to resource potential of the areas.

However, Nyansiongo township in which Nyansiongo tea factory is located may have not been identified as a growth centre. But, the factory was established so as to tap the resource potential (tea crop) from the hinterland (Borabu division).

The identified growth centres were and still are expected to fulfill several functions to promote intra and inter-regional linkages. It was assumed that regional economic growth takes place within a matrix of urban growth centres. Therefore, urban centres through the services they offer such as education, transportation and commercial, do interact with other urban centres and with other associated rural hinterlands. Through this kind of interaction, the regions expected to receive more innovations which could propel development.

Secondly, growth centres are expected to act as a market for agricultural commodities produced from their rural hinterlands. The urban centres were to portray potentials

for industrialization. In other words, they were either to have existing industries to process goods from their hinterlands or show prospects to develop a good industrial base within a short period. The aim of this was to provide a ready and near market for the local agricultural goods, add value to these products through processing and sell them back to farmers or other external markets at higher cost and thereby generate income and employment opportunities to develop both the rural and urban centres.

Thirdly, growth centres were to act as centres of distribution for other bigger industries. For instance, a farmer would not need to travel so far to purchase goods, the goods could be easily available within a centre closeby. Fourth, these centres were expected to limit or reduce the rate of rural-urban migration by offering employment opportunities within a given region. Therefore, growth centres in general were to provide a basis for the government to distribute resources equitably and rationally to all people in all areas of the country.

The rural trade and production centres were geared towards decentralizing economic growth. The criteria for their selection was similar to that of growth centres only that the RTPCs were at a lower level within the rural setting and had to show potentials for growth (economic) basing on the resource hinterland. They were also supposed to exhibit potential for synergetic development linkage with their rural hinterland. An example of selected RTPC is Suneka in Kisii district. This town was selected, due to its rich resource hinterland, a market was put up to tap this resource and a bus park to ensure intra-regional and inter-regional trade and flow of goods.

It has been stated oftenly that no country progresses in development without a firm agricultural base. Therefore, Kenya being a developing country continues to rely on agriculture as her backbone for development. Agro-based industries in particular have been used to tap this resource from agriculture. Basing on the above introduction on how agro-based industries in particular have tried to tap this resource from agriculture, functions of any one growth centre further summarize the expected functions of any one agro-based industry as follows:

- To promote intra-and inter-regional linkages.
- Provision of services such as commercial, health, housing, educational.
- Provide a market for the resource hinterland.
- Act as centres of distribution.
- Limit rural-urban migration.
- Centre for intra- and inter-regional trade.

1.0.4 Statement of the problem

Agriculture continues to play a significant role in rural landscapes and is a vector of great public support for rural areas. Agro-based industries which thrive on this major rural economic activity are an important aspect in rural development too. Shortly after independence, the president of the nation, Mzee Jomo Kenyatta stated very clearly that agriculture was the backbone of the country, that for Kenya to realise full development, the agricultural sector was to play a significant role in this. Therefore a good proportion of the national income went into developing the sector. This move saw the establishment of many agricultural processing plants in essence agro-based industries such as coffee factories, sugar factories, like the Sony sugar and Mumias sugar company, the Kenya Co-operative creameries and many tea factories all over

the country. The aim of this was to increase the per capita income, create employment opportunities as well as tap the rich agricultural potentials of the rural areas so as to stir or propel development of these areas.

Nyansiongo tea factory was one such agro-based industry established in 1974 purposely to tap the resource potentials of tea from the Borabu hinterland. The factory's major aim was to influence the rate of tea production in Borabu and thereby improve the standards of living through raised incomes and employment levels and cause other multipier effects in the region.

However, the problems of increasing rural populations with limited social and economic services become acute in situations where land is scarce. Nyamira district is among the most densely populated districts with an average density of 780 persons per square kilometre. The average farm holdings in Borabu are about 10 hectares per household. With the present population growth rate of 2.16 per cent, the populaton of Borabu is projected to rise to 85419 with a density of 358 persons per square kilometre by the year 2010 up from 68,569 people with a density of 288 persons per square kilometre. Despite the division's rich agricultural base, this increase would put a considerable strain on the resources and jeopardize future developments.

Options to counter this problem are limited; out-migration seems to be a temporary solution, neighbouring divisions are even more populated and there are tribal clashes; increasing productivity is another option though limited by resources; what now remains is on maximising on the utilization and organisation of the land to attain maximum profits.

Borabu is a settlement scheme where people own relatively big pieces of land ranging between 10 and 70 acres of land. It must have been assumed therefore that they had sufficient land and hence they would enthusiastically embark on the growing of tea more seriously. However the people who are basically farmers apportion very little land to tea such that the ratio of tea plot to whole plot is on average 1:13 (field survey, 2000). Therefore, the production of tea compared to the region's potential, is very low. This therefore increases the cost of running the factory, a factor that has limited its role in the development of the division.

If this trend of production continues, the factory might run down to closure. This research therefore endeavoured to study the linkage between the factory and the division's development in terms of income, employement, promotion of intra and inter-urban linkages, service provision. Upon examining these factors, the research aims to propose or suggest possible ways of coming up with a model to assist the factory (industry) thrive and contribute more to the development of the division in the future.

1.0.5 Research questions

(i) What linkages exist between the factory and the division?

(ii) What led to the poor response by farmers in the division towards tea growing?

(iii) What other crops are preferred to tea in the area and why are they preferred?

(iv) What is the potential of the factory in terms of income?

(v) What is the total actual income earned by the factory per annum?

(vi) How do the tea farmers spend their income from tea?

(vii) What problems does the industry face and what could be the possible solutions?

1.0.6 Research objectives

Overall objective:

- To examine the role of Nyansiongo tea factory in the development of Borabu Division.

Specific objectives:

(i) To examine the backward and forward linkages of the tea industry within the division.

(ii) To examine the expenditure patterns of the tea farmers.

(iii) To examine the problems facing the tea industry along the various linkage columns and points.

(iv) To suggest alternative policy measures that could enable the industry contribute more to development of Borabu and rural areas in general.

1.0.7 Research assumption

- Nyansiongo tea factory does not play a significant role in the development of Borabu Division.
- The expenditure patterns of the tea farmers are poor.
- There are weak intra- and inter-regional linkages within the smallholder tea sub-sector.

1.0.8 Justification of the Research

Borabu division was chosen because it presents a different spatial picture in comparison to other divisions in the district. The division is also a newly settled area. Formerly, it was the white man's land. Therefore, the African settlers today still own big parcels of land as compared to their Kisii counterparts in other divisions.

Kenya's economy achieved considerable growth in terms of the quantitative expansion of production between 1964 and 1988 (Ngau, 1989). An integral part of Kenya's sustained economic growth was the impressive performance of the agricultural sector especially in smallholder production. The concept of rural development presents a very complex analysis to planners. This is because the concept is multi-dimensional and requires a multi-disciplinary approach. However, the popular view that has transcended all the critical schools of thought with regard to development is SUSTAINABILITY. Therefore, sustainable regional development can be achieved through the stabilization and restructuring of the socio-economic base of a region.

Borabu division being predominantly agricultural augurs well with this view. It is very crucial that agriculture and industry be complementary and provide necessary inputs that will aid the growth of either. It is in this light that the study is undertaken in order to assess the contribution of agro-based industries (Nyansiongo tea factory) to the process of rural development. The full contribution of the tea factory to the growth of Borabu division and the promotion of rural development can only be examined through an evaluation of the various linkages between the industry and the rural economy and expenditure patterns of tea farmers.

1.0.9 Significance of the Research

This research endeavors to analyze and establish the linkages between the tea industry and the rural economy. This kind of analysis is important in regional planning because the nature and strength of the identified linkages is necessary in the formulation of policies which are most likely to enhance growth in the regional economy. Secondly, knowledge of existing and potential linkages between an industry and other sectors of the regional economy are important in fostering interdependence between sectors and promotion of self-sustained growth in an economy. Thirdly, knowledge of the people's expenditure patterns will further throw some light onto the regional multipliers created from the earnings from the industry. Finally, the spatial organization and management of production is also to a large extent likely to influence the number and level of linkages of a production system and hence its total contribution to a regional economy.

1.0.10 Scope of the Research

The study covered the whole of Borabu division, Nyamira district.The study specifically looked at two levels of analysis corresponding with critical linkages for the rural economy. These were; the farm, the factory, and other multiplier effects at the two levels At the farm level, the relationship between tea and other competing high value cash crops was analyzed together with the attitude of farmers towards tea as a crop. The effects of policy change on the industry's performance is also examined at this level. Still within the division, two out of the four locations (Mekenene and Nyansiongo) were sampled out for interview because it was assumed that this is where the impact of the factory is felt most.

1.0.11 Chapter Outlines:

Chapter one: Introduction and research methodology.

This chapter provides an insight into the problem of research and how to go about the research. It also gives the guideline of the whole research in the methodology.

Chapter two: Literature review

This chapter provides a detailed discussion on agriculture and its role in development both in developing and developed countries. A discussion is given on cash crop farming in the world with special reference to tea. The review the narrows down the scope and looks at cash crop farming in Kenya giving the two models of tea production in Kenya.

The literature further provides a discussion on tea industry in Kenya, its objectives as well as its performance. The issue of liberalization/privatization of the industry (especially the K.T.D.A.) is given a detailed discussion. At the end of the review, the emerging issues are summarized in a theoretical framework.

Chapter three: Borabu Division

This chapter gives the background to the study area. The section therefore enables the reader to understand the context of the research.

Chapter four: Expenditure patterns of tea farmers

Data analysis falls in two chapters. However, this chapter deals with the expenditure patterns of tea farmers in the division. Here, the income and expenditure patterns of

the farmers are analyzed. The advantages and the problems of tea production are also analyzed.

Chapter five: Backward and forward linkages in the smallholder tea sub-sector.

At this level, the factory's backward linkages (inputs) and forward linkages (employment, income, made tea) are analyzed. Other accruing benefits from the factory into the division are also analyzed. The advantages and problems experienced at this level are also analyzed.

Chapter six : Emerging Issues and Recommendations.

A summary of the main findings from the research is given after which an evaluation of these findings is done to determine the policy implications. These policy implications provide the basis for recommendations.

Chapter seven: Summary and Conclusion

This chapter gives a summary of the whole thesis right from introduction through the literature review, area of study, analysis, findings and recommendations and finally the conclusion. The main issues are picked from each chapter and summarized.

1.1 Research Methodology

The approach employed in this study may be refered to as a triple-phased approach. data collection, data analysis and data presentation. Within this approach, this section describes the types of data collected, the sources of these data, sampling, methods of data analysis and presentation.

1.1.1 Types of data collected

- **Geographic and physical characteristics**

This contributes to the background to the study area giving the rainfall, soils, agro-ecological zones, infrastructure among others

- **Cash-crop farming in Kenya.**

This section provides the background to cash crop farming in Kenya with special reference given to tea

- **Tea industry in Kenya**

This sub-section provides a description on the tea industry in Kenya giving its history to date. A special focus is directed towards the liberalization of the K.T.D.A.

- **Income and Employment levels**

Both income and employment constitute the forward linkages within the tea industry A deep analysis into these two aspects will indicate the role played by the factory in the division.

- **Socio-economic characteristics**

The social and economic characteristics of the area of study is an indication of the level of development of the area. Some of these characteristics include health and literacy.

- **Expenditure patterns**

It is just not enough to examine the income levels of a people in trying to determine their level of development. Therefore, an examination is done on the expenditure patterns of the tea farmers as well as the factory workers. These are assumed to be the direct beneficiaries of the tea factory.

1.1.2 Sources of data collected:

The data was collected from two main sources:

Secondary Source

This was data collected from library materials, Government publications, newspaper, KTDA annual reports, factory annual reports and other published books. Collecting data from these documents involved the making of photocopies or making summary notes. These were later critically synthesized and presented. The final work included policy changes on tea industry, agriculture and cash crop farming in Kenya, agro-based industries and rural development among others.

Primary Source

This was data collected from the field. It entailed the use of questionnaires, observation and photography. The study employed three types of questionnaires; household, factory personnel and business. The questionnaires were designed to collect information following the model illustrating the development caused or induced by the tea factory. The questionnaires were used to collect data on the background of the tea factory, employment at the factory, household incomes and

expenditure patterns, infrastructure, trade and services in the area. Interviews were carried out with the factory manager and the District Officer.

1.1.3 Sample frame

The research covered the whole of Borabu division. However, from this various groups were selected for interview: tea farmers, businessmen, the factory employees and government officers such as the district officer II and agriculture officers. A total of 20 tea farmers, 26 factory employees and 16 business people were interviewed. Interview sessions were held with three government officers (the district officer, agricultural officer and lands officer).

1.1.4 Research design

Stratified random sampling was employed at various levels.

The farm:

Borabu division was stratified into four strata basing on location administrative boundaries. Hence, the four strata were:

- Nyansiongo
- Mekenene
- Kiangeni
- Esise

Further the study was limited to two locations. These were sampled out on the basis that this is where the impact of the factory was most felt. From all these two locations, only farmers who grew tea were selected. Basing on a total population of 375 tea farmers in the division, (Field Survey, 2000), one division would therefore be expected to have approximately 93 tea farmers. The technique employed to sample

out the tea farmers was through random sampling whereby tea farmers were randomly selected from each of the two locations. A total of 20 tea farmers were interviewed distributed among the two locations as follows:

Table 1.1: Sampled Locations

Location	No. Of tea farmers
Nyansiongo	8
Mekenene	12
Total	20

Source: Field Survey, 2000

At this level, the tea crop brings in income to the farmer. The farmers then spend their incomes differently. Therefore, the expenditure patterns of the farmers were also examined.

The Factory

Nyansiongo tea factory was the subject of study here. A study was done on the employment capacity, capacity of green leaf, capacity of operatives, number of operatives and their income levels as well as their expenditure patterns was examined. The marketing of the final product was also examined.

Basing on the total number of factory employees being 237, the group of employees was stratified into two; the casuals who are 85 and the permanent employees who are 152. Out of these two groups, a random sample was selected from each as follows:

Table 1.2: Factory Employees Sampled

	Number	Sample	Percentage
Casuals	85	10	11.76%
Permanent	152	16	11.84%
Total	**237**	**26**	**23.60%**

Source: Field Survey, 2000

At this level also other benefits that accrue as a result of setting up the industry were analyzed. These included other multiplier effects such as employment and infrastructure.

The business community

With regard to the multiplier effects of the factory, a survey was carried out within the factory's vicinity (in Nyansiongo township) to establish the effects of the factory on the surrounding population. Systematic random sampling was employed whereby every fifth business enterprise was interviewed along the three major corridors in the town, Manga road, Mosiabano road and along Kisii-Sotik road. Other two centres within the division (Manga, Riamanoti) were selected randomly to represent the hinterland of the factory. In these rural centres, six questionnaires were administered to the owners of the businesses. These were randomly selected to establish the effects of the tea industry on the people of Borabu. A total of 16 questionnaires were administered.

Government officers

Interview sessions were carried out with government officers such as the agricultural officers who provided information on the history of tea in the area as well as its significance, the District officer (D.O) gave an insight into the future of the division in relation to tea as well as the plans that the administration has for the crop, the lands officer provided information on the areas under tea crop.

1.1.5 Methods Of Data Analysis:

The data collected was analyzed both quantitatively and qualitatively. Quantitative analysis was by use of regression and correlation techniques. Qualitative by use of means, averages, percentages, summations. Statistical Package for Social Sciences (SPSS) was used in processing the data collected. The regional multipliers technique was used to analyze the data also.

Regional multiplier

This technique examined the expenditure patterns of those who benefit from the factory in one way or another. It also examined other multiplier effects brought by the factory.

1.1.6 Data Presentation

The analyzed data is presented in various ways: graphs, tables, charts, diagrams, photographs and maps have been used. Explanatory texts are used to draw important insights.

1.2 Limitations Of The Research:

In a broader sense, linkage studies should be undertaken to show the full impact of an economic activity on the regional economy in the form of multipliers. This was however not possible because the study covered only the impact of the industry on income, employment, expenditure patterns and other accruing benefits from the industry as a whole to the division.

- **Limited funds**

Borabu division is an extensive area occupying 238km^2 due to limited funds, only one research assistant was employed. This proved to be a problem because the researcher would be required to walk for long distances. This therefore limited the extent of coverage in terms of the number of questionnaires administered.

- **Time constraint**

Due to the limited personnel in data collection, the time aspect became an issue. Given the two weeks for data collection, a full coverage of the clients was difficult.

- **Electric power rationing**

The field research coincided with the period of power rationing. Therefore, the tea factory was operating at night only. This affected the research process as there were few people to be interviewed during the day.

- **Nature of office work at the factory**

There were delays in collecting data in all the offices visited at the factory and even the buying centres. This was due to the nature of work in the offices, farmers had to be attended to first. These delays limited the amount of data collected.

- **Sensitivity of issues tackled**

One of the main issues tackled was the income levels of the farmers, factory employees and even the total income accruing to the factory. It took several days before all this data was collected. The respondents were very reluctant in providing it.

1.3 Definition of terms

Tea industry

This refers to the production, processing and marketing of tea. It encompasses tea grown on both large scale and small scale. It also entails the utilization of the income accrued for further human development.

Smallholder tea sub-sector

This refers to tea that is grown on land which is less than ten hectares. Therefore, tea plots which exceed ten hectares belong to the large scale tea production.

Rural development

This is a planned process of action designed to fundamentally change the socio-economic conditions of an area through a set of programmes aimed at improving incomes, welfare and employment of the rural people. It also encompasses sound expenditure patterns geared towards further developments (Kangi, 1982).

Agro-based industries

These are processing plants which rely on agricultural products as their major raw material inputs.

Household

This refers to a person or a group of persons living under one roof or several roofs within the same compound or homestead area and sharing a community of life by their dependency on a common holding as a source of income and food which normally but not necessarily means eating from a common pot.

Dependant

Is a person who for one or several reasons depends on another. For the sake of this study, a dependent refers to a person who for one or several reasons depends on the household head for livelihood. The group includes young people below 15 years and old people over 65 years.

1.4 Summary

Agriculture and more especially cash-crop farming in Kenya has been seen as one way of up-lifting the living standards of the rural poor through raising the income levels. In order to develop this sector, Kenya as a nation came up with policies (growth centre policy, rural trade and production centres) in early 1970s in order to develop these areas. As a criteria to designate these centres, the potentials of the hinterlands were evaluated. Agro-based industries were constructed in bid to tap the rich resource (human and natural) hinterlands of the rural areas.

The research was triggered by concern for the high population density in Borabu as well as its growth rate which stands at 2.16 per cent presently. With the limited land, there is need to plan effectively on the current resources in the area so as to ensure the welfare of the future generations.

The study set out to examine the role of agro-based industries in rural development using Nyansiongo tea factory as a case-study. The main focus of the study is to examine the linkage pattern within the smallholder tea sub-sector and the rural economy. The aim of the study therefore is to identify the nature of the linkages, identify the problems or bottlenecks and suggest ways of overcoming them so as to strengthen the linkages for the sake of development.

CHAPTER TWO

LITERATURE REVIEW

2.0.1 Tea Industry in Kenya

Tea was first grown in China, but its origins are lost in the mists of time with the only certainty being that it was drunk in that country more than 5000 years ago. Therefore, Kenyan tea is of Asian origin. (Tea board of Kenya, 1999).

Tea was introduced in Kenya in 1903 when a few tea plants were planted at Limuru in Kiambu District by the white settlers for experimental purposes (Government of Kenya, 1999). Pursuant to the annexation of the land policies through the registration of documents ordinance of 1901 and the Crown Lands Ordinance of 1915, the European Agricultural settlement schemes were reaffirmed when the European Agricultural settlement ordinance was enacted and by 1924 tea cultivation had attained commercial production level (Government of Kenya, 1999). The first legal instrument to govern the production of tea was enacted as the Tea ordinance, 1934. This ordinance was revised by the Tea ordinance, 1948 which became effective on 25th August, 1948. The objective of the tea ordinance of 1948 was to provide for the control of the production of tea in the colony.

Following the agitation for independence from 1947 onwards, a study of the African agricultrue was made and the Swynnerton plan of 1954 was drawn up to be implemented by the government to help improve the African agriculture. At that time, the European farmers were already experienced in the cultivation of tea but African farmers were only

beginning to grow tea. They started planting tea among other cash crops. between 1956 and 1959. (Government of Kenya, 1999).

To promote the cultivation of cash crops. the Special Crops Development Authority (SCDA) was formed under the Agriculture Act in 1960. This body was replaced by Kenya Tea Development Authority (KTDA) in 1964 when the Kenya Tea Development order 1964 was promulgated. At independence in 1963, the tea estates and the few small scale farms had 21,448 hectares of planted tea. The area planted has increased over the years to stand a t113,892 hectares by 1997. (sessional paper No. 2, 1999).

The tea ordinance, 1948 was repealed by the Tea Act of 1960. The substantial growth and structural changes experienced by the industry over the last 34 years is evidently due to the very condusive policy environment that has encouraged continued investment in the estates sub-sector and the smallholder sub-sector.

Kenya is famous the world over for its production of high quality tea. The government recognizes the important role of agriculture in the Kenyan economy in terms of feeding the nation, creating employment, generating increased income, and foreign exchange and providing raw materials for industry.

Tea is currently the leading agricultural foreign exchange earner for the country. In 1995 tea accounted for 20 per cent of total exports earnings followed by coffee which accounted for 15 per cent and horticultural produce accounting for 9 per cent. In terms of ranking. Kenya is the third largest producer of tea after India and China and for some

time now, Kenya has been the second largest exporter of black tea after Sri-Lanka, having overtaken India in 1933. Though India is the leading producer, it consumes much of its produce due to higher domestic demand.

Table 2.1: Major tea producers – 1998

Country	Production (million kg)
India	870
China	665
Kenya	294
Sri-Lanka	281
Turkey	178
Indonesia	166

Source: Statistical Bulletin, 1999

2.0.1.1 Kenya Government Policy On The Development Of The Tea Industry

This policy as outlined in the sessional paper No. 2 of 1999 provides for the development of the industry. The policy has been broken down into sub-policies:

1. To maintain its forward momentum as the best organised establishment in the world for tea which is the most widely consumed non-alcoholic refreshment. The forward momentum here refers to the rapid increase in area expansion and the high rate of tea production.
2. To attain adequate processing capacity, particularly for smallholder tea farmers estates and bridge the gap between the takings (productions) of smallholder and large estates at farm level.

Before tea was planted by Africans on smallholder scale, the estates were playing a monopolistic role. Still after the establishment of tea on smallholder scale, there existed a gap between the smallholder and the estates in terms of production. Today, there is still a gap especially now that the smallholder production has overtaken the estates production by far.

Table 2.2: Planted area by sub-sector (Ha.)

Sector / year	**1999**	**1998**	**1997**	**1996**	**1995**
Estate	94,962,650	118,537,242	91,014,357	113,091,277	105,579,709
Smallholder	153,855,368	175,627,855	129,707,795	144,070,653	138,945,451
Total	**248,818,018**	**294,165,097**	**220,722,152**	**257,161,930**	**244,525,160**

Source: Statistical bulletin, 1999

3. To generate financing required to expand tea processing capacity and for the maintenance of tea roads, warehousing and farmers' logistics to enable efficient leaf transportation. Tea roads are found in all tea producing areas of the country. The finances required to maintain these roads are obtained from cess levied on area planted with tea and on manufactured tea.

4. To generate higher levels of value-added tea through enhanced technological application in order to improve farm level incomes and ultimately foreign exchange earnings from tea. This function is undertaken by the Tea Research Foundation of Kenya (TRFK), a technical arm of the Tea Board of Kenya based in Kericho. Its main functions are to carry out research on the control of pests, diseases, improvement of planting materials, husbandry, yields and quality.

5. To expand the international market for Kenya tea through aggressive strategic marketing within the various regional economic blocks (e.g common markets for Eastern and Southern Africa,, Economic Commission for West African States (ECOWAS), South African Development Co-operation among others, South East Asia, Middle East, Eastern Europe, Americas and Kenya's traditional West European markets.

It is the role of the East African Tea Trade Association (EATTA) to expand the international market for Kenya tea. The Association brings together tea producers, brokers and buyers of tea in Eastern Africa. The objective of the association is to promote the best interest of tea trade in Africa, to ensure the orderly marketing of tea, to foster closer relations within the trade and to collect and circulate statistical information to members in conduct of their business. It is a requirement that tea dealers must be members of the association.

6. To improve the management of tea factories by allowing farmers to play their rightful role in decision-making. Initially, the farmers' role in decision-making was very minimal. However, following the report on the privatization of KTDA, by the 12 man technical Committee, more responsibilities have been vested on the factory directors in a bid to enhance grower participation in the management of the smallholder tea sub-sector.

In order to ensure the pursuance of the above policy, the Kenya government has provided the legal backing through the Tea Act (Cap 343) of the laws of Kenya. In section 25 sub-

section 2, there are regulations for the protection and promotion of the tea industry of Kenya. These are:

a) Prescribing the areas outside which tea may not be planted, and regulating and controlling the variety, the cultural conditions, the method of production and manufacture of tea and the grading of manufactured tea, and providing for the control of pests and diseases;

b) Regulating and controlling the method of packing, and blending manufactured tea for sale, for consumption in Kenya, including requiring holders of licences and permits to supply manufactured tea to the established agency for packing and blending manufactured tea for sale;

c) Empowering the Board or the Director to give directions to any planter as to the method of sowing, planting and cultivation of tea and the harvesting, collection, movement, processing and storage of tea leaf and to delegate the like powers to any servant of the Board or public officer;

d) Requiring the submission of returns, reports and estimates by the holders of licences and permits under this Act and others;

e) Prescribing the periods for which licences shall be issued.

f) Prescribing the fees to be paid for anything to be done under this Act.

g) Prescribing the forms which may be used under this Act.

h) Prescribing anything which under this Act may be prescribed.

Therefore, this policy having been guiding the development of tea industry in Kenya, it has achieved a lot in relation to the performance of the sector both nationally and internationally. However, there are bottlenecks in a few areas or aspects which need to be

filled. For instance in the area of attaining adequate processing capacity, some factory companies such as those under K.T.D. Agency are operating below adequate capacity.

Additionally, there has been laxity on the part of the Board in implementing these regulations such that growers have no guide or direction in tea cultivation, harvesting and processing.

2.0.1.2 Privatization Measures In The Tea Industry.

Prior to liberalization initiatives, the ministry of Agriculture was charged with the role of decision making in agriculture and its functions spanned the entire sector, leaving little if any, individual entrepreneurial decision making in the hand of farmers. While this arrangement was useful in those times, with the globalization of the economies it has become necessary to restructure some of the economic sectors with a view to enhancing the private sector involvement.

The process to liberalize the tea industry started in 1992 when the government of Kenya (GOK) and the World Bank (IDA) signed an agreement under the Public Enterprise Reform Programme covering five major parastatals. The Kenya Tea Development Authority was included among the five strategic parastatals remarked for liberalization and restructuring under the programme. (Governement of Kenya,1999). The process of liberalization of KTDA and the smallholder sub-sector has resulted into incorporation of KTDA under the companies Act (Cap 486) as an independent and private tea enterprise, owned by smallholder tea farmers through their respective tea factory companies.

The Ministry of Agriculture in conjuction with other stakeholders in the tea industry has developed a detailed restructuring strategy for the tea industry that defines the roles of the various actors in the industry such as the Tea Board of Kenya and the Tea Research Foundation as regulatory and research development agencies; the Kenya Tea Development Authority, the Nyayo Tea Zones Development Authority and the large estates as self-regulatory apex bodies and the tea factory companies and farm units as private entities in their own capactities. The aim of this strategy is to restructure and eventually privatize the entire industry.

2-0.1.3 Origin of Smallholder Tea Industry in Kenya.

The first tea bushes were planted in Kenya at Limuru near Nairobi by a Mr. Caine in 1903. By 1925 big names such as James Finlay and Brooke Bond had replaced the imported products with some surplus for export. The 1930s saw a slump in export trade due to the then existing depression and composition in local market. The Kenya tea growers association was formed in 1931 to promote the interest of all persons concerned in the cultivation of tea in the country. Overproduction by the lending producers: India, Sri Lanka, Dutch, East Indies or Indonesia led to the introduction of the international tea planting restriction scheme under the first teas agreement signed in Amsterdam in 1933 (Kenya Export News, 1991). The industry has never looked back ever since. Though it was not until much later that Africans in Kenya were encouraged to grow the crop.

With the dissolution of the SCDA in 1964, KTDA, a parastatal corporate body, undertook to promote and foster the growing of tea on small scale farms which were considered at that time unviable in view of the expertise required and the cost involved as

witnessed in the plantation sector. Therefore, this was a daunting task for the budding organisation.

A great deal of the boost in yield levels emanated from a decision to permit KTDA to directly import compound fertilizers for its farmers, thereby allowing for timely availability of the correct type of the commodity to tea growers. The combined effect of the targeted yield was to raise smallholders tea production to 128 million kilograms by the year 2000 compared to 69 million kilograms recorded in 1986 (Kenya Export News, Dec. 1991). Kenya's smallholder tea growers are anticipated to account for well over 50 per cent of the 9.5 billion work of tea that will be produced in the year 2000. The steady rise in production and exports of Kenya tea since independence form Britain in 1963 is unmatched anywhere in the world. The industry has continued to see new records set only to be broken a season later particularly during the last couple of years.

Table 2-3: Tea Production Since 1963

Year	Made tea (kg)	Exported tea (Shs.)
1963	18,082,363	100,260,000
1973	56,578,100	339,509,600
1983	100,644,735	2,470,000,000
1990	169,585,181	6,300,000,000
2000	_____	9,500,000,000

Source: Kenya Export News, 1993

Due to the rapid increase in area expansion and the high rate of tea production, the government has invested heavily on infrastructural development particularly in the rural

areas where the industry is based. The industry has a total of 83 tea factories for the manufacture of tea spread out in the growing districts and served by numerous buying centres and tea leaf bases. The tea industry is a major employer with current estimates of over two million people in direct tea farming, manufacturing, marketing and indirectly in retail outlets and transportation.

2.0.2 Liberalization of Kenya Tea Development Authoriy:

2.0.2.1 Overview of the small-scale tea sub-sector and Kenya Tea Development Authority

KTDA was established in January 1964 with the objective of fostering and promoting the country's tea growing by the smallholder tea farmers. In bid to realize its goals and objectives, the Authority developed centralized operational and administrative systems extending from the headquarters in Nairobi to the tea-growing areas. The KTDA in its efforts to promote and foster the development of Kenya's smallholder tea has been performing the following functions as provided by KTDA order under the Agriculture Act (cap 318).

i) It establishes and finances the tea nurseries and supplies planting material and fertilizers to the farmers for cash or credit terms.

ii) It supervises cultivation, growing and harvesting of green leaf and provides training facilities.

iii) It arranges for the inspection, collection and transportation of green leaf to the factories.

iv) It arranges for the processing of smallholders' leaf in existing factories or new ones and participates in financing them, and also organises the marketing of processed tea.

v) It engages in revenue collection and payment to growers and also in technological advancement and research.

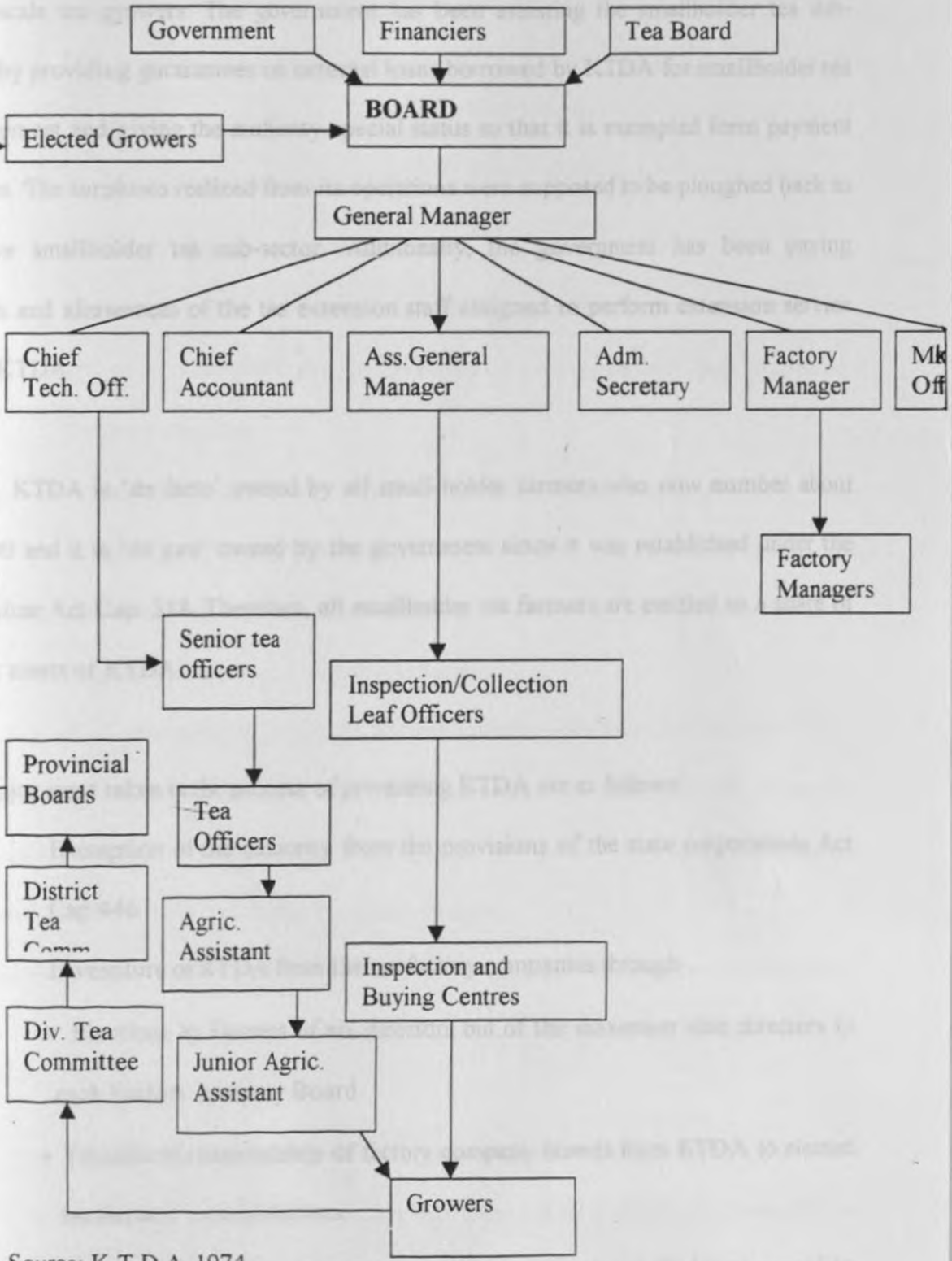
The former formal organisation of KTDA has been under the Board on which sit representatives of the growers, the government, financiers and the tea Board. Under the general manager, the various departments are organised to deal with the various functions of the authority namely field supervision, collection, processing, marketing, accounts and administration. (Michoma, 1980). the former structural organisation of K.T.D.A. is as shown on figure 2-1.

KTDA has made the smallholder tea sub-sector one of the most successful agricultural ventures in the developing world. Since its formation, the Authority has achieved over 73,000 hectares of tea. The total number of smallholder tea producers under KTDA is about 300,000 who process their tea through 45 tea factories.

2.0.2.2 Privatization/Liberalization of Kenya Tea Development Authority

KTDA has been rendering managerial, production, transportation and marketing services which includes among others management of tea factories, green leaf transportation,

Fig. 2-1: Structural Organisation of K.T.D.A.



Source: K.T.D.A. 1974.

and procurement of production goods. Marketing and payment of tea proceeds to the small scale tea growers. The government has been assisting the smallholder tea sub-sector by providing gurarantees on external loans borrowed by KTDA for smallholder tea development and giving the authority special status so that it is exempted form payment of taxes. The surpluses realized from its operations were supposed to be ploughed back to improve smallholder tea sub-sector. Additonally, the government has been paying salaries and allowances of the tea extension staff assigned to perform extension service under KTDA.

Today, KTDA is 'de facto' owned by all small-holder farmers who now number about 300,000 and it is 'de jure' owned by the government since it was established under the Agricultue Act Cap. 318. Therefore, all smallholder tea farmers are entitled to a share of the net assets of KTDA.

The major steps taken in the process of privatizing KTDA are as follows:

1. Exemption of the authority from the provisions of the state corporations Act Cap.446.
2. Divestiture of KTDA from the tea factory companies through:
   - Elections by farmers of six directors but of the maximum nine directors in each Factory company Board.
   - Transfer of chairmanship of factory company boards from KTDA to elected tea farmers' representatives.
   - Direct participation by elected directors in management decisions regarding procurement of goods and services by each factory company.

- Direct participation by elected directors in formulation of annual budgets and monitoring of financial expenditures
- Direct participation by elected directors in recruitment of factory company employees.
- Transfer of green tea leaf collection and payment to farmers from KTDA to individual factory companies.
- Empowerment of the farmers through their elected company directors who are now responsible for governance and policy making their respective factory companies.
- Allotment of ownership shares to all small-holder tea growers in their respective tea factory companies.
- Strict information and data disclosure by KTDA to factory companies regarding marketing of tea by the Agency.

3. Repeal of all previous KTDA orders and replacement with legal notices No. 109 to 112 of 1997. These new legal notices placed control of KTDA Board under the farmers' elected representatives who number 12 out of a total KTDA board membership of 17 including the managing director.
4. Removal of provisions in KTDA orders which previously required the Board to seek the minister's approval before making major investment decisions.

Despite the above mentioned measures which have resulted in greater empowerment of farmers, majority restructuring of KTDA has been undertaken to enable the authority to fully face the challenges of new international financing requirements, modern management techniques and the competitive international market. These are: First,

KTDA is incoporated under the companies Act (Cap 486) as an independent and private tea enterprise, owned by all smallholder tea farmers through their respective factory companies. The company's shareholding will therefore be held indirectly by individual tea farmers through their tea factory companies; Secondly, the name of the new company is Kenya Tea Development Agency (KTDA) Limited. This Agency offers management services to the individual factory companies. The factory companies are independent and thus may opt if they wish to contact any other management agent to manage their operations. KTDA limited charges a management fee based on minimal percentage of the net value of the proceeds form tea. Thirdly, the constitution of shareholding is based on the current valuation of KTDA assets, allocated in accordance with contribution of each factory company. Finally, the net worth of KTDA is distributed to the factory companies relative to their contribution in form of management fees. Basing on this information, the new functions of the new KTDA limited are as follows.

General Functions of KTDA limited

To offer management services to the individual factory companies.

Specific functions of KTDA limited.

1. Provide financial, secretarial, personnel and administrative services to the factory companies in accordance with specific agreements. Clear distinctions are established regarding personnel employed by KTDA limited and those engaged by factory companies.
2. Retain and operate existing leaf bases.

3. KTDA limited in consultation with the farmers to provide guarantees for loans for the construction of new tea manufacturing factories.
4. Continue to service existing loans on the old terms until the same are fully paid.
5. Pay taxes just like any other company under the companies Act. The taxes are; stamp duties, corporation tax.

This expert organization is viewed as being crucial to the success of empowering the tea grower and expanding the smallholder tea production in Kenya. Figure 2-1 shows the new formal structure of KTDA limited.

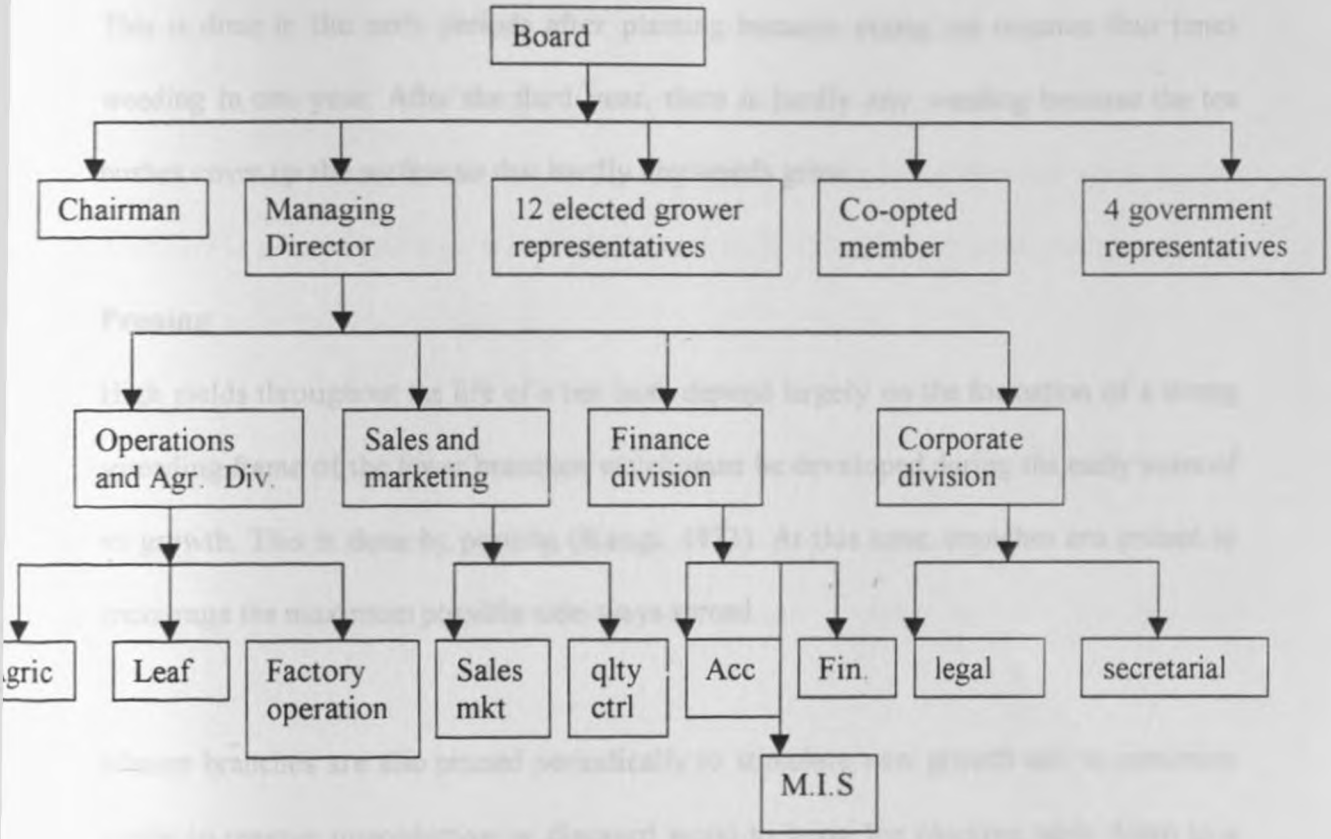
2-0.3 Development of tea

Tea is a forest tree, Camellia Sinensis, which would grow to heights of 6 to 18 metres if it is left wild. But when cultivated in a farm, it is maintained by pruning to the height of one metre. The crop has an economic life of about 50 years. It needs careful planting, weeding, pegging, skilled pruning and selective plucking. If any mistake is made in any of these, yields and therefore profits will be affected. Let us look into each of the stages.

Land preparation

Land has to be dug deep. Failure to do this will affect the growth of the tea bush. On steep slopes, bench terraces are constructed.

Figure 2-2: Structure of K.T.D.A. Limited



Source: KTDA limited news, 1999.

Planting

Tea is planted by two main methods; from seedlings, and from vegetative propagation. The second type involves taking cuttings from selected mother bushes of proved performance. Using seedlings or stumps is a slow method which takes four years. Vegetative propagation takes only six months before cuttings are planted in the field. Cuttings are planted in holes about two feet deep and 9-12 inches wide on a well prepared field. The spacing adopted west of the rift valley has been 5 by 3 inches giving 7183 plants per hectare. East of the rift valley spacing is 5 by 2.5 inches giving 8620 plants per hectare (Michoma, 1980)

Weeding

This is done in the early periods after planting because young tea requires four times weeding in one year. After the third year, there is hardly any weeding because the tea bushes cover up the surface so that hardly any weeds grow.

Pruning

High yields throughout the life of a tea bush depend largely on the formation of a strong spreading frame of the lower branches which must be developed during the early years of its growth. This is done by pruning (Kangi, 1973). At this time, branches are pruned to encourage the maximum possible side-ways spread.

Mature branches are also pruned periodically to stimulate new growth and to maximize yields to remove unproductive or diseased wood to bring the plucking table down to a manageable height to allow correction to an over plucking table by giving a fresh start. Bad pruning affects yields and therefore profits. The Kenya Tea Development Authority has set out standard pruning procedures.

Table 2-4: Standard Pruning Procedures

Year after planting	Height of prune (inches)
1	6
2	11
3	13
4	16
5	18
6	20
7	20
8	21
9	22
10	23

Source: KTDA news, 1994

Plucking:

Plucking starts in the fourth year of a tea bush raised from a stump and in the third year of a tea bush from a clonal cutting. Plucking is done between the prunes. Plucking is a skilled hand preparation which has an important influence on the leaf quality. Fine plucking is emphasized (two leaves and a bud) by K.T.D.A which gives high quality tea that fetches in the world market.

A tea plot is divided into a number of sections which are plucked at different times. During flush periods, plucking rounds results in underplucking and this affects the bush. Too long a period between the plucking rounds results in loss of tea yields and therefore loss of income.

Tea therefore is an evergreen tree which flourishes in warm rainy regions of the tropics and the sub-tropics. Its original habitat was the triangular-shaped area, Cambodia, North-East India and southern China. If unattended, the tea plant can grow to a height of between 30 and 70 feet. It requires deep well-drained soils (4-5.8pH). In Kenya, ferrosols offer the highest potential. Tea requires rainfall of above 1750mm. The best quality tea is grown at high altitudes where extreme temperatures (more than 30^0) are less marked and growth is slower. (Michoma, 1980).

2-0.4 Tea In The Major Producing Countries

Of the major tea producers, India, Bangladesh, Sri Lanka, Indonesia, the soviet union, Mozambique and Malawi rely on estate producers while Taiwan, Japan, China and Kenya focus on both smallholders and estate production. Smallholders have caught the interest

of governments following the success of the smallholder scheme in Kenya. The tea industries of these traditional producers have several problems; more than 30 per cent of the tea bushes in India are more than 50 years old, in Sri Lanka, about two-thirds of the bushes fall in the 5 to 40 years bracket (Chowdhury, 1974).

By contrast, African tea growing countries have several advantages over the older producers. First, African factories have modern designs and have up-to-date equipment. This reduces processing costs and limits frequent break-downs. Secondly, soil deterioration has not reached an advanced stage. Thirdly, tea plants are young and high-yielding due to vegetative propagation.

2-0.5 Models Of Tea Production

There are two models of tea production in Kenya and in the world at large, estate and smallholder production. In Kenya, before independence, there was only one model of production, estate production. The smallholder production model was introduced after independence when Africans were allowed to plant the crop. We shall look into each model in turn.

2-0.5.1 Estate Production

This is the initial model that was introduced by the Europeans. It involves a scenario whereby a tea processing plant relies on its own established plantation or large scale farms for its green leaf input. Green leaf from other sources is supplied into the factory as surplus. Therefore, the major supplier of the green leaf is the plantation which is owned by the factory.

This model has got unique qualities which are cherished. First, there is efficiency of operation and organisation. Due to the large scale in operation, it becomes more efficient to operate or handle. There is more concentration paid to the large farms as compared to small farms.

Secondly, there is a high quality product realized through better management during the growing and manufacturing stages. Due to the degree of concentration and specialization, there is more inputs employed in terms of skills and technology so as to realize as higher a profit as possible. As a result, a high quality product is realized. Associated with the second profit, there is availability of experienced and knowledgeable personnel and there is access to research information. This personnel contributes to high quality as well as high volumes of the final product. With estate production, finance is easily obtained. This is because tea is planted on large scale and thus, the value of this tea in monetary terms, is high. One can easily obtain loans for further development.

Estates generally provide facilities which would otherwise not be available. Social facilities such as educational and medical facilities are provided by the estates for its workers. These facilities contribute a lot to the wellbeing of even the surrounding areas or community. We look at this as an added benefit due to the existence of the estate. Estates are connected with other agricultural endeavours with resultant lower costs for products such as fertilizers. Because of the large scale in production, the inputs such as fertilizers are purchased at wholesale price, this leads to reduced costs of inputs and linkages with other manufacturing industries.

However, estates are seen to create an alienating environment where employees depend fully on the employer. Estates in Kenya such as the sugar estates in Western Kenya have created an environment whereby the farmers depend entirely on the employers (sugar processing company) for their pay. If the company does not come to harvest the sugar, then the farmer goes at a loss.

2-0.5.2 Smallholder Production Model

Smallholder production of tea in Kenya and in other tea producing countries of the world had proved to be a success in the past. This model in Kenya, arose after independence when the Africans (Kenyans) were allocated parcels of land. Therefore, they could not grow tea on large scale. Since the soils and domestic factors were favourable, the Africans were allowed to grow tea though on small scale, hence smallholder tea production. Processing plants were established for the sake of these smallholders so as to process and add value to the crop. Nyansiongo factory in Borabu division is one such example of these industries.

The model has unique advantages over the estate production. First, the smallholders are not economically dependent on one crop and therefore not subject to price slumps. Under this model, farmers plant several other crops. In case of a price slump in tea, the farmer has other crops to support him economically. Smallholders also ensure that individuals retain their hold on the land. This is unlike in the estate model of production whereby workers are employed to work on the estates which belong to the factory.

Disease and insect attacks do not spread rapidly. Due to the sizes of the tea plots and mixed cropping, diseases from one farm do not spread rapidly to another farm as is the case in estate production. The farmers are in a position to control the spread. Smallholder production provides the easiest means of expanding production where there are established factories and high population densities. With established factories which ensure a high capacity of green leaf intake coupled with a high population in a given region, the people can be advised to either plant the crop for those who have not planted or improve their production.

Lastly, the profits that accrue from the smallholder model of production, a higher percentage goes into the local economy. These profits lead to further regional multipliers. For instance, a smallholder may spend his income to invest in; building a house, putting up a posho mill or a retail shop, investments which will employ other people who will further be enabled to educate their children. However, the smallholder model of production has led to underproductivity of certain factories in some areas. Since the farmers are independent in decision-making, it affects the productivity of the factory in that if the farmers decide to reduce their acreages of tea plots, the factory can operate below optimum.

The smallholder model encourages greater participation of the local community in tea production hence leading to greater rural development impact. The large scale model tends to be monopolistic and less participation with limited impact on rural development.

Within the tea industry, the sustainability of establishing smallholder production versus that of estate production under any given set of conditions is a discussion that has not come to any conclusive agreement. Each system of production seems to have unique advantages that do not necessarily apply to the other. Therefore, the choice of one model will depend on what advantages are deemed more beneficial to those of another.

2-0.6 Rural Development

The development of rural areas is seen as an integral part of the overall development strategy because the bulk of the population (90 per cent) in Kenya reside in the rural areas. Therefore, rural development in Kenya is accorded a very high priority in the development strategy with deliberate attempt to direct an increasing share of the total resources towards the rural areas (Ominde, 1970). The rural development strategy pays special emphasis to improving the standard of living of rural residents as well as raising the standard of services such as educational and health towards levels that exist in urban areas. However, the question remains, is the sector being given this priority ?.

The strategy of accelerated rural development therefore constitutes a wide range of individual programmes such as improvement of infrastructure, poverty alleviation, environmental preservation, enhancement of partnership, gender sensitivity in development, development of a systematic framework of urban centres among others. The formulation of rural development strategy was vested in the Special Rural Development Programme (SRDP) and the District Development Committee (DDC) while

the implementation of the strategy is left to the operating ministries which will ensure that the funds for the planned projects are available.

Colon (1987) observes that the range and diversity of integrated rural development programmes and projects result from their being based on a subject of the larger system of project activities that are combined to reach a part objective. Agricultural production for instance will require activities such as markets for farm produce, productive credit, extensive education, local verification trials and farm to market roads. The strategy therefore adopts a synthesized approach to solving problems that affect the welfare of the rural population while it aims at boosting agricultural production. It also strives to redress the imbalance in the distribution of social and economic opportunities (Kamuyi, 1987).

According to Tititola (1980), the integrated rural development programme is consciously formulated, systematic, multi-sectoral and aims at attaining the integration of income groups in a country. He views it to be aiming at; generation of employment, equitable access to land, fairer distribution of income, widespread improvement in health, nutrition and housing, improved opportunities for all individuals to realize their full potential through education and a strong will for individuals in shaping the decisions and actions that affect them.

The subsequent paragraphs give an elaborate discussion on the specific subjects considered under integrated rural development as briefly mentioned above (section 2.0.5).

2-0.6.1 Rural Development And Poverty Alleviation

Rural poverty, a dominant feature of life in all regions of the world, affects the lives of about one billion people (IFAAD, 1994). The rural population in more than 110 developing countries (FAO, 1996) while urban poverty is a growing phenomenon, the rural poor still act for over 80 per cent of the total number of poor people in those countries. There are five types of rural poverty (IFAD, 1994).

(i) Interstitial poverty

This type is caused by material deprivation and alienation. It implies pockets of poverty surrounded by power affluence and ownership of assets.

(ii) Peripheral poverty.

This constitutes a combination of material deprivation with isolation and alienation found in marginal areas.

(iii) Overcrowding poverty.

Has got to do with population pressure and limitations to resources.

IV. Traumatic/sporadic poverty.

Involves vulnerability to natural calamities such as drought, labour displacement and insecurity. It can be transitory but ends up being endemic.

V. Endemic poverty.

Is caused by isolation, alienation, technological deprivation, dependence and lack of assets. Poverty has many manifestations and it is not possible to describe the lives of the poor by means of a single indicator. In recent years, this yardstick has been supplemented by more composite indices as follows (IFAD, 1994).

(a) Food Security Index (FSI)

This is a major concern of developing countries. Of the thirty-five low food security countries, twenty-one are in sub-Saharan Africa. The twenty countries ranked lowest according to this index are also drawn mostly form sub-Saharan Africa.

(b) Integrated Poverty Index (IPI)

In terms of their relative rural poverty, 66 countries (58 per cent of the total) have severe poverty index (IPI>0.40), 26 have moderate poverty (0.4>IPI>0.2) and relatively little poverty (IPI<0.2). Therefore more than four fifths of the countries studied belong to either severe poverty or moderate poverty groups. In sub-Saharan Africa, 80 per cent of the region belongs to severe poverty group.

(c) Basic Needs Index (BNI) and Relative Welfare Index.

Least Developed countries such as Tanzania and Zambia rank relatively high in terms of BNI. The provision of basic social services to the rural population depends not only on the level of Gross National Product per capita and its growth, but an adequate allocation of budgetary resources and a cost-effective delivery of services.

The smallholder farmers in Kenya constitute about 71 per cent (three-quarters) of the rural poor, most of whom live in high medium potential agricultural regions. The poorest segments are in the arid and semi-arid lands, combining crop farming and pastoralisms. 27 per cent are declared destitutes and have been relying on food aid (Dahberg, 1985). However, poverty is not confined to disadvantaged areas alone (Greenshields, 1983). A significant and growing proportion of rural households in Kenya find themselves in a

situation where adequate land is not available to provide sufficient food or generate enough cash. Therefore, landlessness explains why there exists rural poverty.

2-0.6.2 Rural Development and Environmental Preservation.

The rural areas in many developing countries and in Kenya in particular base their economic growth on agro-based industries. With the growing concern for the protection of the environment which has rapidly developed on a worldwide scale, the management and disposal of refuse from industrial operations has assumed a critical role in today's society (World Bank, 1988). This is partly important in developing countries many of which are undergoing rapid growth in their economies whereby industry is the major element in that.

The production of industrial goods involves the extraction of natural resources and the disposal of unwanted materials not utilized in the final product (UNEP, 1988). These processes raise two major environmental problems for industry. The first to dispose of the wastes that industry generates; gaseous waste causes air pollution, liquid wastes pollute ground and surface water, and the careless disposal of hazardous solid waste leads to soil contamination and the pollution of surface and underground water supplies. In the past, many wastes were never treated at all. Today, inefficient treatment processes pose many problems. Incineration at sea or on the land and the dumping of waste into the oceans, are under severe attack from environmentalists.

The second major problem faced by industry is how to conduct its affairs without subjecting its workers and the public to risk of accident, risk of exposure to dangerous

chemicals and risk in the work place (occupational hazards). By the early 1970s, industry awareness was mounted, demand for more and better products accelerated in both the developed and the developing countries. Governments responded in both the developed and the developing countries. Governments responded by imposing new standards on industry such as installing clean-up technologies and pollution control equipments.

For the industrialized north, pollution levels are being reduced but for the south, the trend is in the reverse direction. Pollution levels are increasing and heavy industry is expanding, fast that introducing clean technologies cannot compensate for this rate of expansion. Therefore, for one to talk about rural development, a major consideration must be taken in examining impacts or effects on the environment so as to ensure sustainable development.

2.0.6.3 Rural Development and Gender Issues

The current tendency in developing countries is generally towards a rigid but not static division of labour between men and women. Although new options may exist for the lucky few, for the majority of women, especially in rural areas, development has not brought change for the better but for worse (UNDP, 1980). Development has as a rule been accompanied by complex and painful societal disruptions. Urban areas have been favoured over rural areas in resource allocation which has led to polarization of society into rich and poor. A closely associated but until the 1980s, overlooked phenomenon was the intensified dichotomization of the relationship between men and women, leaving women relatively worse off than men even though both are hard hit by rural poverty. This factor has led to rural - urban migrations.

Women carry a very substantial responsibility for the maintenance of rural life. However, since much of the work they do is of subsistence nature, rural women have generally been ignored by planners. As a result, they continue to suffer with increased population, pressure on land and other resources (UNDP, 1980).

If the commonly advocated, more broad-based rural effort is to succeed, an inescapable conclusion would be rural women, must be given increased support to enable them perform their traditional and new tasks in a more productive and rewarding way. The notion of bottom-up approach cannot be effected without the participation of women in the rural development projects (design and implementation) (Chant, 1989). Women through their own initiatives have successfully organised to improve both their economic power and status in rural communities.

Women face several obstacles to participation including cultural prejudice. Until early 1970s, programmes devised to improved productivity, basic amenities and living conditions in rural areas tended to have two major design faults.

- They took little or no account of local knowledge of the environment and cultivation methods.
- They tended to be addressed to household heads.

The second fault in the design of rural development programmes/schemes up to 1970s, that of channeling initiatives to male household heads, resulted form a failure to recognise work done by women. It was assumed that women worked as part of their wifely duties, as part of their marriage contract. However, the emphasis began to shift in

1970s and planners increasingly recognised that women's contribution and participation were crucial if development has to have permanent effects (Chant, 1989).

2-0.6.4 Rural Development and Infrastructure Development

The term infrastructure incorporates both social and physical infrastructure. One of the aims of rural development is to raise the living standards of the rural people. This can only be achieved through improvement of health services, improving the road networks development of a systematic framework of urban centres and expansion of rural water programmes among others. Improving the health facilities implies that the people's health standards will also improve, they will live longer and produce more economically. The improved road network will facilitate their agricultural production by linking the rural area to the outside market. The urban centres will provide the markett for the agricultural produce.

2.0.6.5. Rural Development and Governance

Governance has got to do with building bridges between top-down policies and local initiatives. It therefore incorporates the implementation of sectoral policies with a territorial approach. It involves the issue of working as partners in decision-making. Therefore sectoral policies should have a rural development dimension.

SUMMARY

The issue of rural development is quite wide. The above discussion has attempted to give a detailed description of what it entails. The various factors described seem to be interdependent. In a nutshell therefore, rural development can be defined as "an

integrated strategy directed to the rural areas so as to raise the living standards of the rural poor to standards that compete with the urban areas". These standards include poverty reduction, gender equity, development of infrastructure, environmental conservation, partnership among others.

2-1 Evolution of agricultural policies

Colonial period

The main objective behind the acquisition of Kenya as a protectorate were economic - to provide the British with a new source of raw materials and markets for the surplus goods produced due to boom in production after the industrial revolution (Sorrenson, 1967). One main policy during this period regarding to Agricultural production was the **Swynnerton plan** of 1954. This was a report entitled "A plan to intensity the development of African Agriculture in Kenya" drawn by assistant director of Agriculture at that time, Mr. R. Swynnerton. The plan was to intensify the production. Swynnerton was to change the course of Kenyan land law. He introduced titles based on individuals land ownership. This plan saw the introduction of cash-crops to all races. This resulted in a politically contented and stable community.

Post-Independence (1964-1980)

At independence, agricultural policies were based on principles in sessional paper number 10 of 1965 on African socialism and its application to planning in Kenya, which emphasized political equality, social justice and human dignity. The state was the entity that maintained law and order. The state also outlined and implemented social and economic programmes in a bid to remedy historical and social inequalities (Nyangito,

1998). The principles were reinforced by the failure of capitalism and markets after the great depression when state intervention through the marshall plan, keynesian demand management and the welfare state were succeeding (World Bank, 1997). The policies at independence were founded on equitable income distribution, employment and self-sufficiency.

Post-Independence (1981-1992)

This period was characterised by many factors. First and foremost, there was a shift from government control to liberalized market. This provided for an enabling environmental for enhanced participation by the private sector. The liberal ideology emphasized a reduction of state intervention in the economy and free market operations. This was partly due to the high cost of socialist development. The ideology stressed that the state's role should be limited to creating an enabling environment for individuals and associations to freely pursue economic and social objectives subject to obeying the law (Okello, 1998). The emphasis during this period was on:

- A liberal grain market.
- Removal of price controls on all agricultural commodities.
- Decontrol and relaxation of fertilizer import licency board.
- Price decontrols.
- Removal of obstacles in marketing and distribution system.
- Removal of government support on most investments and services and a corresponding shift towards privatization and cost-sharing.

Post-Independence (1992-2000)

Agriculture grew at a rate of 2.8 per cent in 1993-1994 followed by 4.8 per cent in 1994-1995 (Nyangito, 1998). Despite this, controversies have arisen in implementation of the reforms among various stake-holders. For tea and coffee there is a general dissatisfaction from stake-holders that the government is still holding onto some controls especially in the export market for the cash crop.

2-2 Theoretical Basis For Rural Development

Several theories have tried to describe rural development. Awour (1979) in her M.A (planning) thesis entitled 'Relationship of Kisumu's industrial sector to the resource hinterland observes that the Kenya government adopted the policy of concentrated decentralization of various ecomic activities throughout the country in pursuance of national objectives of reducing regional inequalities and stimulating growth of the rural economy.

Spatial planning in Kenya takes cognizance of the interdependence of polarized centres of development and the regions around them. If this inter-dependence is strengthened in the process of development, it is assumed that the envisaged interaction will lead to cumulative self-sustaining growth.

2-2.1`The Growth Pole Theory

Many scholars have contributed to the development of this theory. Hansen (1972) observes that no economic activity is located at a point without a spatial dimension. He then goes further to question, how then do we determine an optimum spatial dimension of

all economic activities? The answer to this question necessitates the need to integrate location and economic growth theory.

Blang (1971) suggests that economic growth manifests in the increase of total output. For Perroux (1955) the problem of growth theory is to explain the nature of these structural changes. Perroux states that when a propulsive industry raises its output, it induces expansion in the outputs of other industries. When the induced growth in outputs is greater than the initial growth of the propulsive industry's output, such as propulsive industry is called a key industry.

Hirschman's theory of development takes cognizance of interdependent input-output linkages between industries and an articulation of their significance as they relate to the process of induced economic growth. He observes that innovations contribute to the growth of growth poles by improving the competitive position of industries, through development of new products, establishment of new industries in growth poles which for economic reasons could not have been previously located in the pole. The growth pole theory does not go without questions, hence a critique.

2-2.1.1 A Critique of the Growth Pole Theory

First of all, spatial ramifications of industrial change are poorly developed in the theory. The notion of growth pole should also throw some light on the nature and significance of the spatial relationships existing between a growth pole and its surrounding area. These are dynamic relationships but how much do we know about their dynamism?

The growth rates of output and productivity are closely related to per capita income growth in a given pole. Bourns observes that an industry tends to grow at a declining rate, its rise being eventually followed by decline. This decline therefore may not lead to positive growth.

2-2.2 Growth Centre Strategy

This is essentially a policy geared to attaining a balanced regional economic growth. This policy is closely related to the growth pole theory. The aim of this policy is to decentralize the growth poles in any one region. Therefore one finds a hierarchical system of growth centres covering the whole country into which industrial investment of varying scales is to be directed. In Kenya, the major growth poles are Nairobi, Mombasa; other growth centres that were established to decentralize the poles include Nakuru, Kisumu, Malindi among others.

To achieve maximum benefits, a growth centre must be seen to function efficiently through emphasis on infrastructure services, growth–stimulating economic activities such as small industries and other investments. The subsequent investment in the centre is expected to lead to the development of resources within the town and its sphere of influence in terms of stimulation of production processes, industrial and commercial activities.

Growth centres in a region are important in that they provide functions such as provision of marketing, facilities of agricultural commodities and distribution of consumer goods and industrial products for agricultural development, development of agro-based

industries, development of infrastructure, initiation of information and communication systems for new science and technology, reduce migration of people to the growth poles among others.

Just as for growth poles, growth centres have limitations. The assumption is that growth centres do benefit much wider areas. However, the extent to which this initiated economic development at the centre spreads to their less urbanized hinterlands is not known quantitatively. This could be analyzed through an analysis of linkages that exist. Therefore, it is the aim of this research to show how the nature of the prevailing linkages enhance or retard development in an area.

The functions of growth centres coincide or are quite similar to the objectives of rural development as outlined by the Human settlements strategy document (1978) composed by the physical planning department of the ministry of lands, Kenya. The objectives were to increase productivity of land as a major precursor to all other rural development activities, to increase income generation from agriculture, to maximize employment opportunities, to increase the purchasing power of rural population through viable rural industrialization, to increase non-farm employment opportunities, to provide supportive services such as extension, markets, processing, to improve infrastructure, improve administration of rural development programmes and induce self-help activities.

Nyansiongo tea factory, is located in Nyansiongo urban council. This centre agrees very well with the above description of growth centre. The study aims at evaluating to what extent the factory / industry has been the major driving force behind the centre's

development, and further how it has influenced growth in the hinterland (Borabu division). Urban rural linkages are similar but not the same as industrial linkages. Therefore, it is important to look at industrial policies and hinterland development at this level.

2-3 Industrial Policies and Hinterland Development

An industrial strategy is considered a necessary prerequisite for development of the economy of third world countries (Awuor,1979). This is reflected in the capacity of industrialization to generate new employment and income opportunities which stimulate greater productivity and bigger domestic markets. These views are reflected in the 1979-1983 National development plan which states that with the future rapid expansion in the manufacturing sector, it will be looked upon as a major source of employment and income for urban and rural dwellers. However, in order to attain these aims, the decision on where to locate an industrial project can be as crucial to its impact on development of the country as the very decision to undertake the project itself.

Traditional theories provide broad guidelines for industrial location and regional planning in developing countries. Penner (1947) formulated the general principle of industrial location. He states, an industry tends to locate at a point which provides optimum access to its ingredients. This may be referred to as the law of location for fabricating industries which seek a site close to raw materials, market, power and labour among others. Given the current intra and inter- regional imbalances in industrial development in Kenya, the government adopted a policy of industrial dispersal to ensure that the benefits of industrial growth are distributed as equally as possible throughout the country.

Therefore, location of industrial projects should be closely related to urbanisation. Due to economic and locational efficiency, the industries were located in designated growth centres. The government encouraged the import substitution as an alternative to lead to industrial development in the country. This does not make the economy internally oriented but secure a firm market for international capital against competition from other international capital. The aim of this study is to examine whether the tea industry in Borabu has caused development in the Borabu hinterland.

2-3.1 Industrial Linkage and Hinterland Development

This is basically a study on the industrial linkage. Linkage studies are concerned with identification of potential flows with the view of revealing the region's actual or potential position. There are five types of linkages (Awuor,1979) which need to be defined to permit full appreciation of their importance in any given linkage structure. These are:

- **Backward production linkages**

They involve moving closer and closer to the basic inputs to a production process or even to indirect inputs.

- **Forward production linkages**

They involve further processing toward a finished product or expanding an existing production process so that a broad array of outputs are produced from the same kind of materials presently used as inputs.

- **Distribution linkages**

They exploit the region's location in the inter-regional transportation network.

- **Commercial and service linkages**

They are oriented to the region's potential retail trade and personal services trade areas.

- **Other linkages**

They have to do with public services and institutional linkages such as roads, water supply education, religion among others.

Hoare (1978) observes that industrial linkages reveal how firms consider the access to forward (market) and backward (supply) linkages as paramount to locational advantage of a modern industrial complex or conversely major drawbacks in peripheral areas. This is important because most developing countries have adopted the policy of industrial dispersal or decentralization to lagging regions without knowing the full implications of such an option. He concludes that linkages develop preferentially with closer rather than more distant firms. In the growth pole theory, it is postulated that expansionary changes in the lead sector may lead to economies of scale which could result in the lowering of prices of its goods in the other forward linked industries whose growth may be stimulated. Similarly, the backward linked industries supplying the lead sector with inputs would expand.

The approach employed in this study is focused more on the nature of the linkages rather than on how the growth of the Nyansiongo tea factory has quantitatively affected other

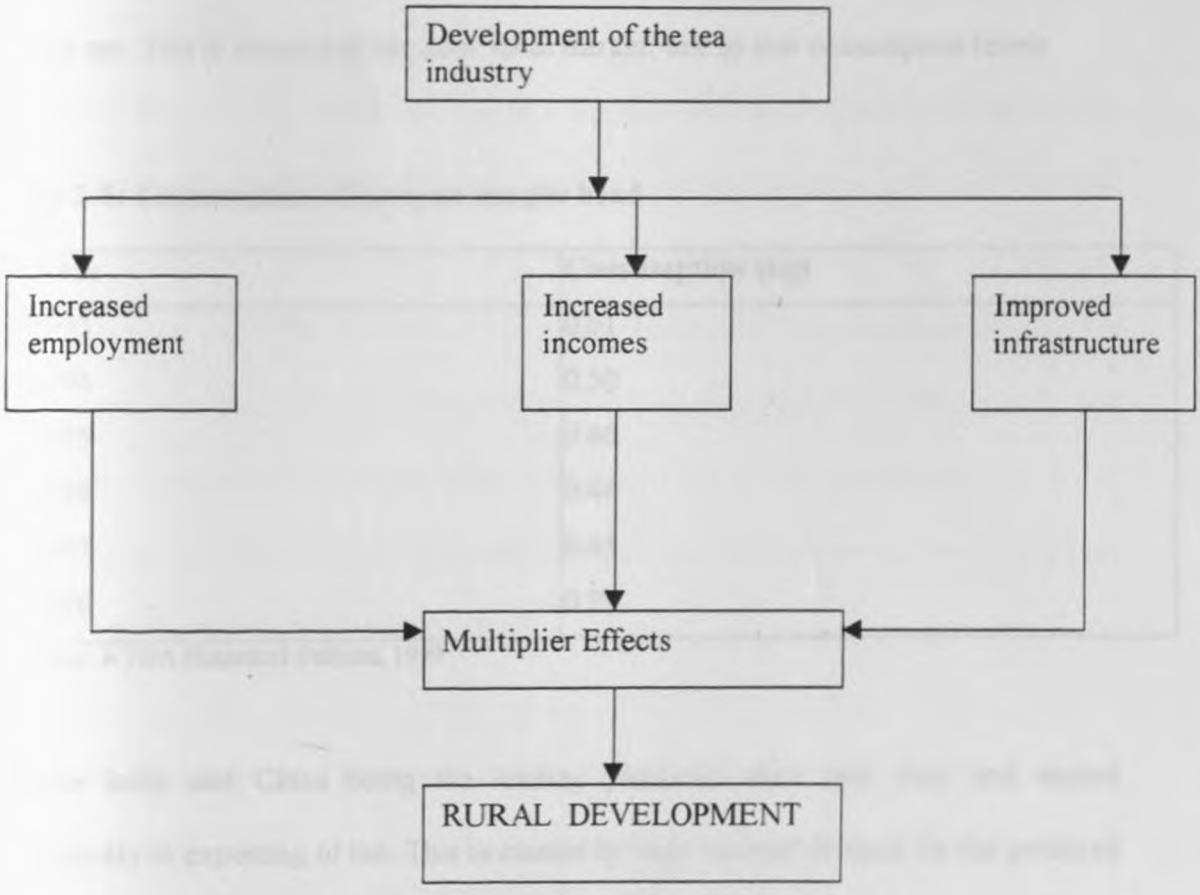
industries. Darkoh (1975) writing on planned industrial relocation pattern in Ghana echoes Beyer's observation by saying that planners should ensure that each project using local materials contribute significantly to the rest of the growing industrial and rural hinterlands. This therefore requires careful physical planning of proposed linkages based on a detailed analysis of resources available, labour, skills, markets and investments. Therefore identified locational strategies should ensure that intersectoral and intra-regional linkages are intensified in the economy.

There are three ways in which an industry spreads out from its initial point of growth: horizontal expansion through straight-forward duplication of existing units and exogenous growth whereby new industries that neither duplicate nor stand in close technical relationship with those existing. When these are well chosen, they eventually set in motion further expansion based on the principles of horizontal and vertical growth which corresponds to the usual forward and backward linkages; Vertical expansion through addition of new types of existing units. Therefore identification of such aspects with regards to the tea industry in Borabu would serve as useful indicators in testing of the hypothesis that the development of rural areas can be achieved through location of industries in selected regions or areas. With this view in mind, what then is our conceptual framework to guide the study?

The development in the tea industry is seen to induce development in the region in terms of increased income, creation of more employment opportunities and improvements in infrastructure. Development is also realized through other multiplier effects which result

due to the increased incomes from tea. All these are geared towards rural development as shown in diagramme 2-1.

Diagram 2-1: CONCEPTUAL FRAMEWORK



Source:Researcher,2000.

Many scholars have studied the linkages between rural industries and their immediate hinterlands. Such studies have concentrated on the impact of industries on employment levels, income levels and improvement of infrastructure. The gap now remains on the further multipliers as a result of increased income levels.

2.0.3 Emerging lessons

Tea is produced in many countries of the world. Kenya being the third largest producer of black tea in the world after India and China, our focus here may be narrowed down to these two leading countries. India relies on estates mode of production while China and Kenya focus on smallholders for much of their tea. Today, Kenya is the leading exporter of black tea. This is because of her poor local market, due to low consumption levels.

Table 2-5: Consumption of Kenyan tea per head

Year	Consumption (kg)
1993	0.61
1994	0.50
1995	0.46
1996	0.44
1997	0.43
1998	0.39

Source: KTDA Statistical Bulletin, 1999

Despite India and China being the leading producers they rank third and second respectively in exporting of tea. This is caused by high internal demand for the produced tea. Tea is the leading export commodity in Kenya contributing to about 20 per cent of total export earnings in Kenya. Tea production is labour intensive. In Kenya, it accounts for about 2 million jobs in direct or indirect employment. Tea growing and manufacturing are carried out in the rural areas thereby contributing significantly to rural industrialization and development. A research on tea and human health carried out by FAO revealed that tea consumption decreased the risk of certain chronic diseases like cancer, dental and cardiovascular diseases. Tea production is also environmentally

friendly as no chemicals other than fertilizers are used in its production. The strategy of integrated rural development therefore constitutes a wide range of individual programmes such as improvement of infrastructure, development of human settlements, imparting skills, increasing per capita income, increasing or creating more opportunities for employment among others..

A detailed discussion on rural development together with the tea industry in Kenya has been given. It can therefore be said that agro-based industries can, if properly organised, induce important spin-off effects in rural areas of underdeveloped countries. Bearing in mind that the organisation of production in most underdeveloped countries brings about inter-regional and urban-rural inequalities. Development efforts should ensure that interaction flows generated by the modern sector do not stratify the space economy but allow upgrading of production and income levels in rural areas so as the development benefits reach a majority of the population.

With this view in mind, the study endeavours to establish the role of one agro-based industry in the regional economy through employment, increased income levels, material and investment linkages.

CHAPTER THREE

BORABU DIVISION

3-0 Introduction

The area of study is Borabu Division. This section provides a detailed description of this area along various sub-topics.

3-1 Position and size

Borabu is one of the five divisions in Nyamira district. Nyamira is one of the nine districts of Nyanza province (see map 3-1) Nyamira was curved out of Kisii district in 1989. Borabu division shares boundaries with Rigoma division to the West, Ekerenyo Division to the North, Nyamira division to the North West, Bomet District in the South East,Transmara district to the South and Kisii district to the South East (see map 3-2). The latitudes range between $0^0$30" and $0^0$45" south and longitudes. The division occupies and area of 238 Km^2 which constitutes the biggest division in terms of area within the district (see table 3-2). The division interacts very well with the surrounding areas in terms of migration, markets as well as employment as shown on the map.

Table 3-1: Area of the district by division

Division	Area (Km^2)	Density
Nyamira	180	962
Ekerenyo	215	774
Borabu	238	288
Manga	91	988
Rigoma	141	892
Total	865	X=780

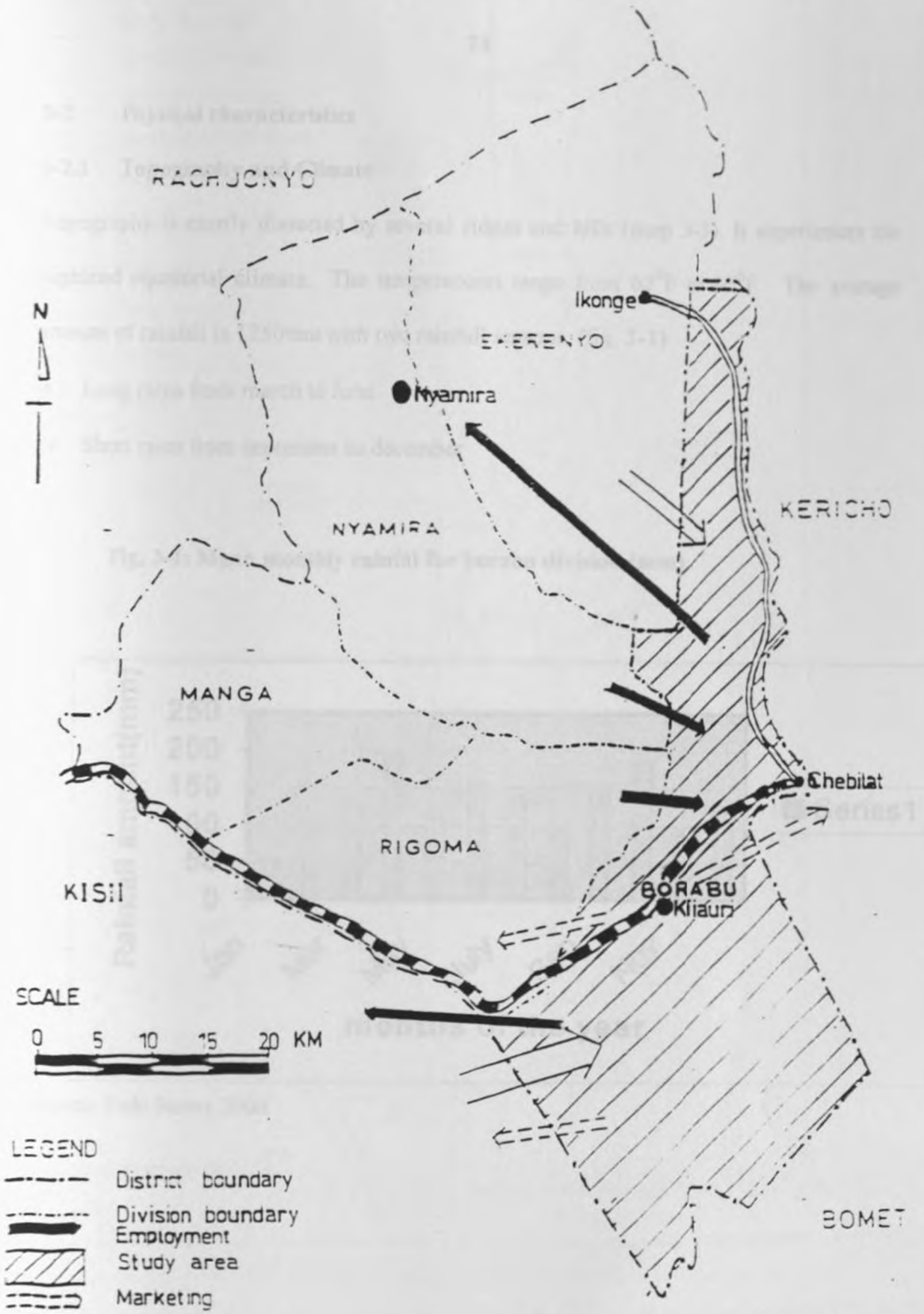
Source: District statistical office. Nyamira, 1999.

Map No. 3-1: Borabu Division – Regional Context

Source : (Field Survey, 2000)

These boundaries and the district headquarters are still tentative and should not be quoted.

Map No. 3-2: Borabu Division – District Context



Source: Nyamira District Development Plan. (1997-2001).

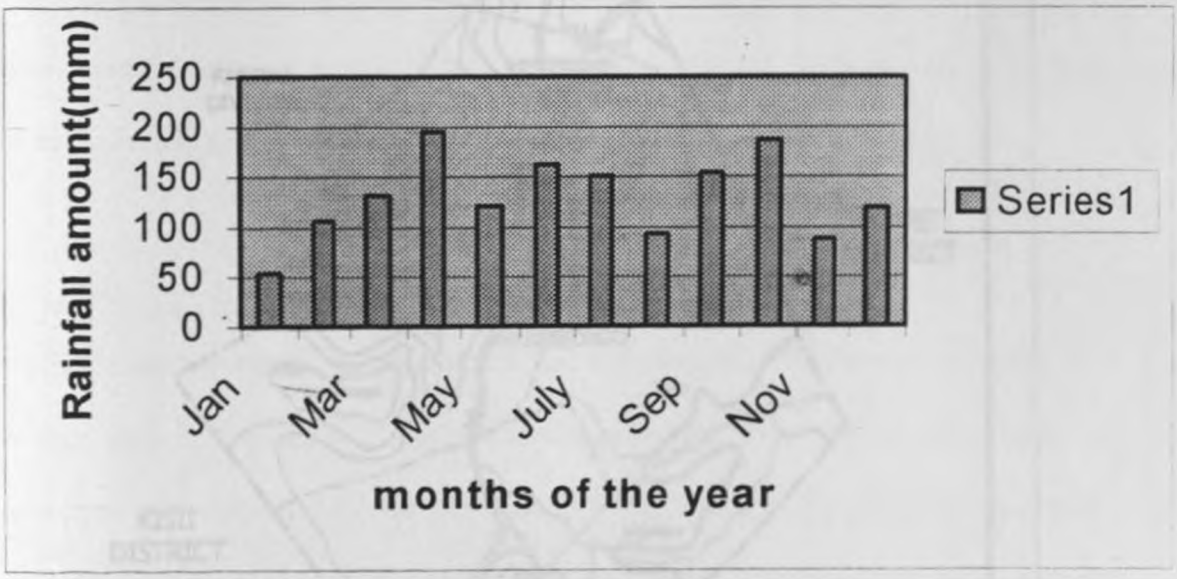
3-2 Physical characteristics

3-2.1 Topography and Climate

Topography is mostly dissected by several ridges and hills (map 3-3). It experiences the highland equatorial climate. The temperatures range from 62^0F to 65^0F. The average amount of rainfall is 1250mm with two rainfall seasons: (fig. 3-1)

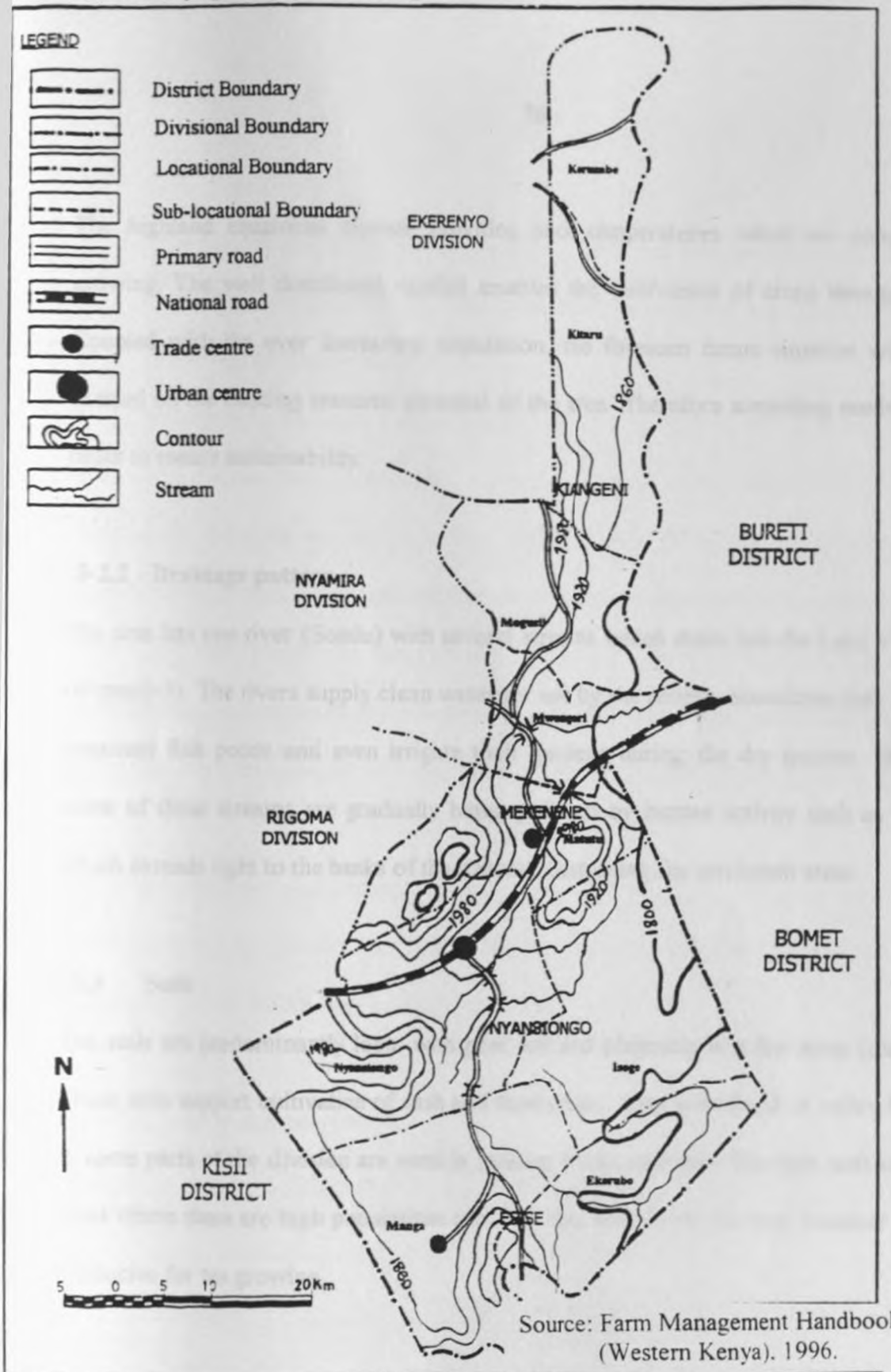
- Long rains from march to June
- Short rains from september to december

Fig. 3-1: Mean monthly rainfal for borabu division (mm)



Source: Field Survey,2000.

Map No. 3-3: Topography and drainage



Source: Farm Management Handbook (Western Kenya). 1996.

The highland equatorial climate provides cool temperatures which are conducive for tea growing. The well distributed rainfall enables the cultivation of crops throughout the year. Coupled with the ever increasing population, the foreseen future situation will be pressure exerted on the existing resource potential of the area. Therefore something needs to be done in order to ensure sustainability.

3-2.2 Drainage pattern

The area has one river (Sondu) with several streams which drain into the Lake Victoria (ref.map3-3). The rivers supply clean water for use by the people. Sometimes they use it to construct fish ponds and even irrigate their gardens during the dry seasons. However, some of these streams are gradually being polluted by human activity such as farming which extends right to the banks of the streams, destroying the catchment areas.

3-2.3 Soils

The soils are predominantly loam with peat soil and planosols in a few areas (map 3-4). These soils support cultivation of cash and food crops. Clay soils found in valley bottoms in some parts of the division are used in making bricks and tiles. Tea does well in fertile areas where there are high populations too. The clay soils in the division however are not conducive for tea growing.

3-2.4 Agro-ecological zones

The division falls within two agro-ecological zones (see map 3-5):

I. The lower highland tea-dairy zone (LH_1). This zone has got deep and well drained reddish brown friable clay soils with thick humus top soil which support tea growing and dairy cows.

II. Lower highland maize - wheat-pyrethrum zone (LH_2) this zone also has deep and well drained friable sandy clays. It supports maize, wheat, pyrethrum.

Both zones therefore are conducive for the cultivation of various crops, a factor that reveals the high production potential of the division. Irrespective of the lower-highland zone being unconducive for tea growing, tea is still grown in this area. However, in comparison, the produce from these areas is relatively lower than produce from the other zone. However, the zone can be made more productive by use of appropriate fertilizers.

3-3 Administrative and Political units

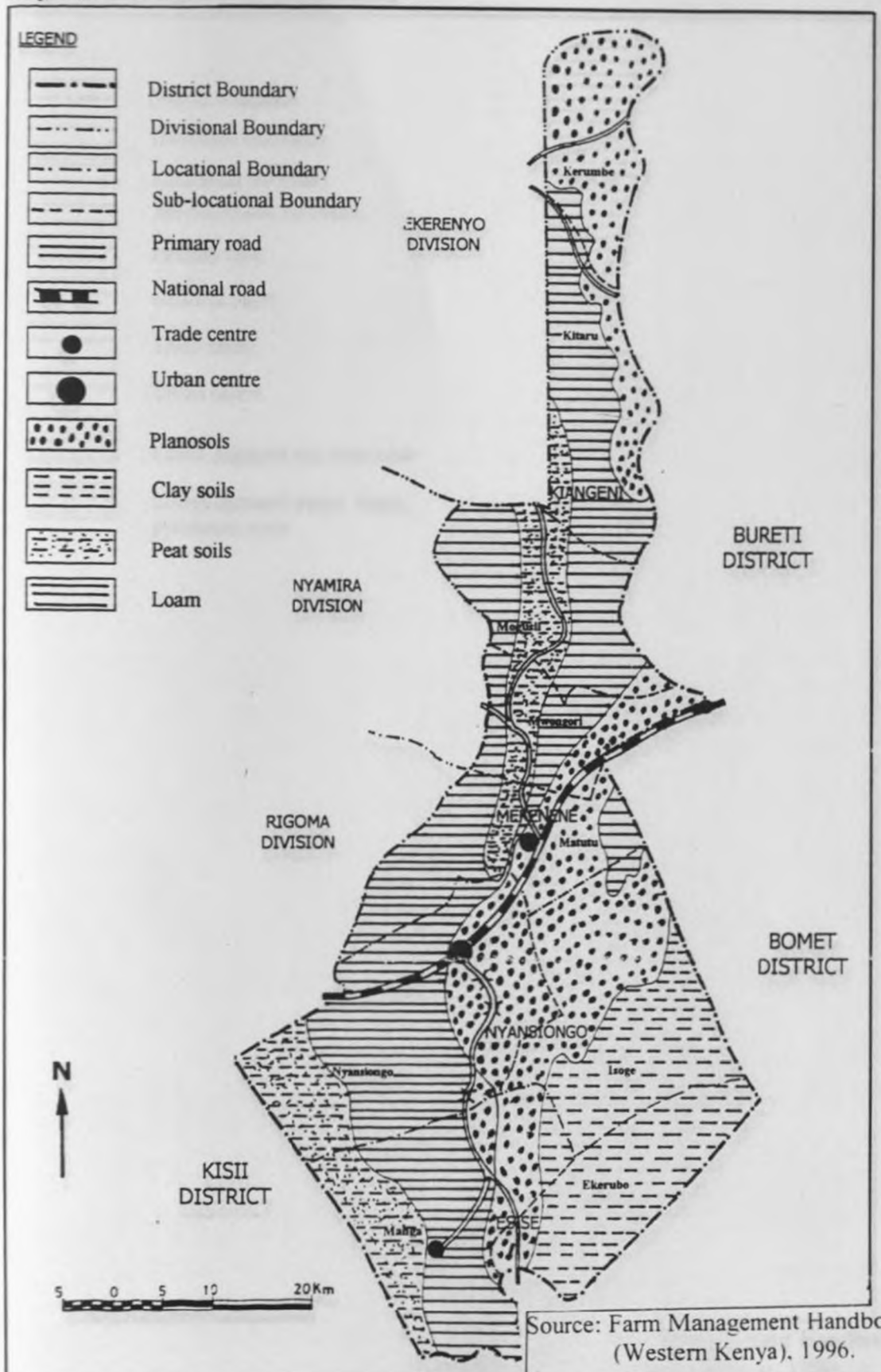
Borabu division is divided into four locations and nine sup-locations (see table 3-3) Borabu division is within North Mugirango constituency.

Table 3-2 : Administrative units

Location	Area (Km^2)	Sub-Locations
Nyansiongo	85	Isoge/Kineni Nyansiongo/Gesima
Esise	55	Ekerubo Manga/laitizo
Mekenee	53	Mwongori Matutu Mogusii/Nyagacho
Kiageni	45	Kitaru Nyakono/Kerumbe

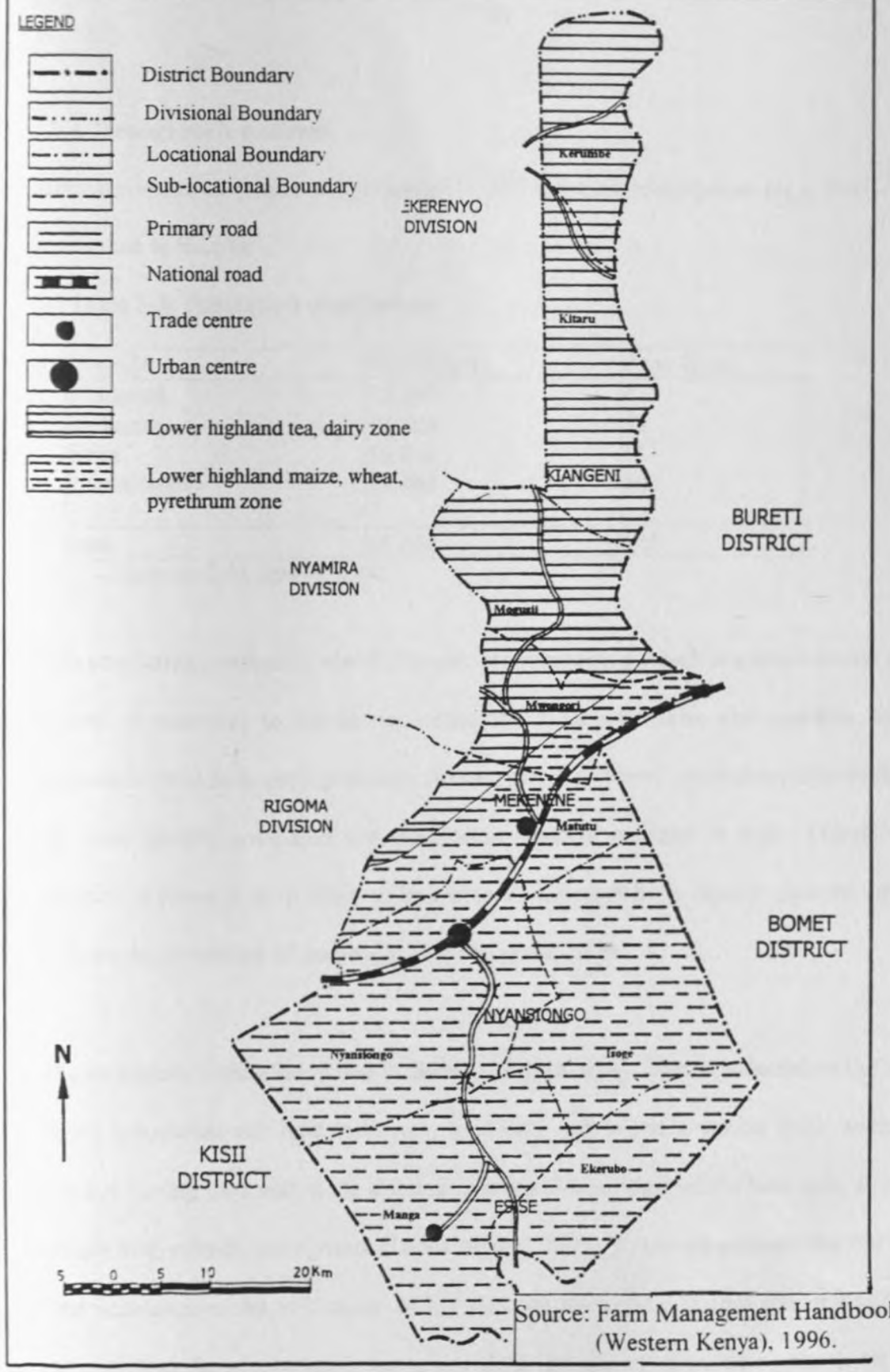
Source: District statistical office, 1999

Map No. 3-4: Soils



Source: Farm Management Handbook (Western Kenya), 1996.

Map No. 3-5: Agro-Ecological Zones



Source: Farm Management Handbook (Western Kenya), 1996.

3-4 Demographic patterns

Borabu division has a total population of 68,569 (District development plan, 1997 - 2001) distributed as follows:

Table 3-3: Population distribution

Location	Population	Area (Km)
Kiangemi	12,964	45
Mekenene	15,269	53
Esise	15,845	55
Nyansiongo	24,488	85
total	68,569	238

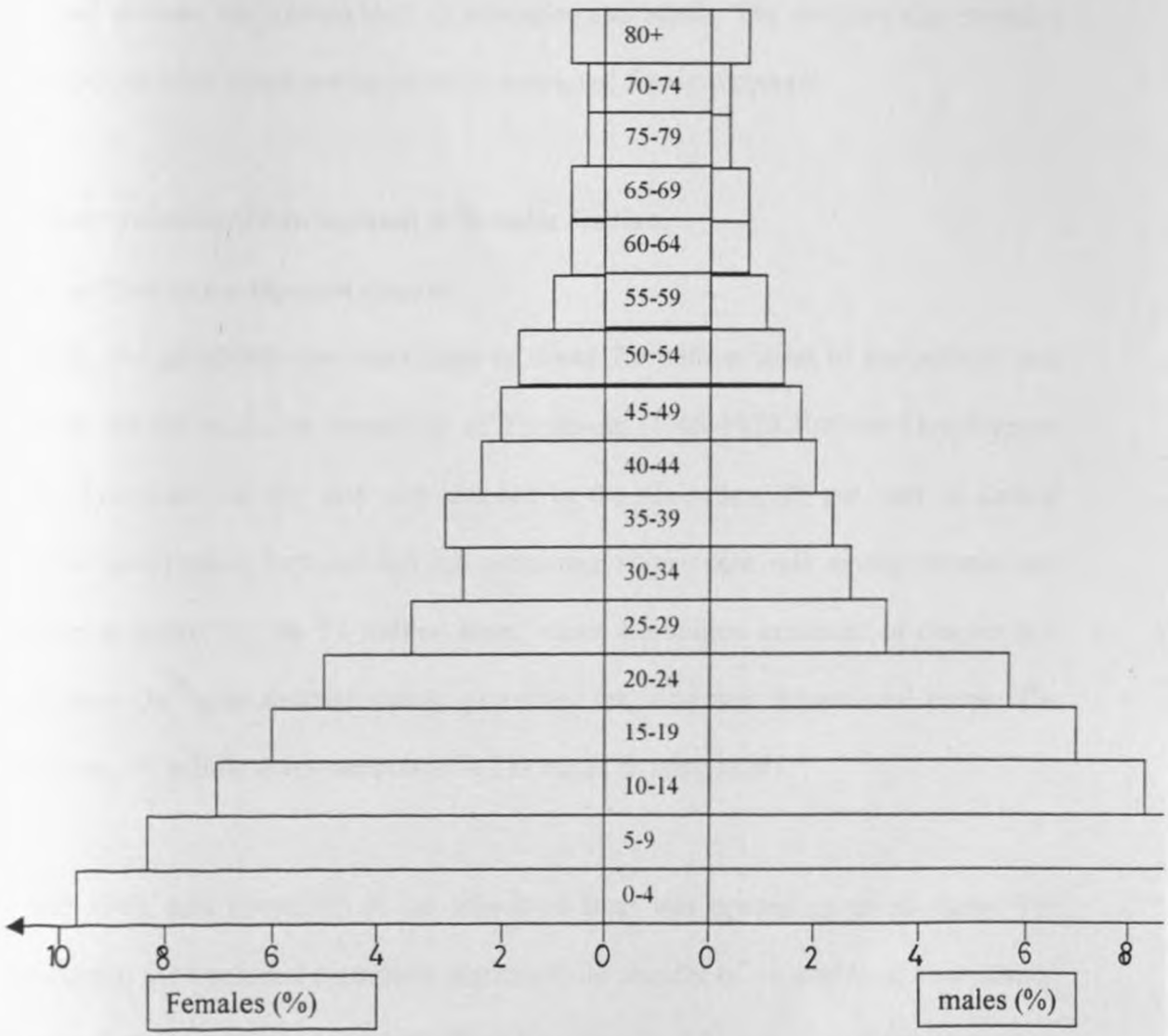
Source; field survey, 2000

This population grows at a rate of 2.16 per cent per annum which is a much slower rate of growth as compared to the district's rate of 3.5 per cent. This also explains why the division is the least densely populated in the district. However, even though the division is the least densely populated, the population pressure on land is high. Therefore, the situation in future is most likely to be worse off hence, there is need to plan for activities to boost the livelihood of the people now and in the future.

The immigrant population found in Borabu is quite high . This is reflected in the rate at which households sell land to buyers. It is very rare to get a person from within the division buying land still in the division. Almost 100 per cent of the land sold, is sold to people from outside the division (Lands officer, 2000). It was established that out of the total population of 68,569, about 24 per cent are immigrants (Lands officer,2000). It is expected that the percentage is yet to rise given the current population growth rate. The remaining 76 per cent was said to be due to the natural increase and high fertility rates. Out of the total immigrant population, a majority (60%) come from the neighbouring Kisii

district (ref.map 3-2) and 40 per cent from the neighbouring divisions such as Ekerenyo. Given the existing scenario, the increase in population in the division will definitely jeopardize the resource base of the division and limit future utilization of the same. Breaking this population further down by sex, the situation is as follows.

Figure 3-1: Age-sex pyramid-1999



Source: field survey, 2000

A greater proportion of the population are under age 35, the cohorts which demand a lot of services such as education, health. The projections imply the need for even greater service provision hence the need to improve the socio-economic base of the division. It is hoped that the improvements in the tea industry, tea being a high value cash crop in the area, will assist in achieving this goal. Twenty-seven per cent of the population constitutes the people in the reproduction age bracket. This implies high fertility rates, high dependency ratio and pressure on services such as education and health. The structure also reveals a strong labour force which can be gainfully employed for development.

3-5 The evolution of development of Borabu division.

The million acre settlement scheme

In 1960, the scheduled areas comprised of about 7.5 million acres of agricultural land reserved for the exclusive ownership of Europeans (1966-1970 National Development Plan). Two-thirds of this land was situated in the rift valley, 25 per cent in Central province and Eastern Province and the remaining 10 per cent split among Nyanza and Western province. Of the 7.5 million acres, about 4.1 million consisted of ranches and plantations the latter devoted mainly to coffee, tea, sisal and horticultural crops. The remaining 3.4 million acres were classified as mixed farming land

In late 1960, land ownership in the scheduled areas was opened up to all races. The government felt a political imperative to promote the transfer of ownership of a substantial acreage in the former scheduled areas from Europeans to Africans. Out of this imperative was born the million-acre settlement scheme designed to accomodate the Africans smallholders and a variety of schemes to assist Africans of greater means and experience

to take over the large farms intact. Political and economic considerations dictated tha this massive land transfer should, for the most part be confined to initially to the mixed farming areas. On the political side, it was mixed farming areas which largely bordered on these sections of the former African areas where pressure of population and livestock on land was greatest. On the economic side, the ranching areas and sisal plantions were too dry for arable agriculture of a type to which Africans in the overcrowded land units were accustomed

Prior to the start of the large-scale land transfer in 1962, the agriculture of the former scheduled areas produced 78 per cent of the gross value of marketted agricultural output accounting for about 42 per cent of the total employment in Kenya. Between 1962 and 1965, over 1 million acres was transferred to Africans. There were different types of schemes: high density; low density; co-operative farms. High density schemes were designed to relieve population pressure in overcrowded areas by accomodating the greatest possible number of smallholersd within a given settlement area. The settlers had to be unemployed and landless but have some agricultural knowledge. Priority was given to previous employees of the farm on which a scheme was located. Selection was made by committeess appointed by District Commisioners in districts for which specific schemes had been designated. The averge plot sizes on all high density schemes was 28 acres.

Low density schemes were built around better qualified smallholders with demonstrated agricultural activity and some savings of their own. The schemes aimed at a subsistence income and cash of 100 pounds or 250 pounds in some schemes. The planned average plot size was 35 acres. The co-operative farms were designed for areas which on account of

difficult soil conditions, low rainfall are not suited to smallholder agriculture. In total the schemes were 12 whose sizes ranged between 130 acres to 41000 acres.

Table 3-1: Land Transfered To African Ownership As At 1968

Farm Type	Area Transfered (1000 Ha.)	No. Of Farms	Average Area(Ha)
Smallholer			
• High density	319	26,700	11.9
• Low density	76	5,200	14.6
• Squatters	35	14,000	2.5
Sub-total	**430**	**45,900**	**9.4**
Large farms			
Individual-owned	386	1,192	324
Co-operatives	118	34	3464
Sub-total	**504**	**1226**	**3788**
Total transfer	**934**	**47,126**	**19.8**

Source: Kenya Development Plan 1970-1974.

Borabu division was among the smallholder low density scemes with an average plot size of 14.6 hectares. The settlement schemes were benefitial to the economy in that they were a source of income, foreign exchang and employment for the national economy. They also accomodated a growing population on an increasing standard of living. By 1968, the government would have contracted about 16 million pounds of interest bearing debt to finance the existing schemes.

What then is the situation today ? During the transfer period, very few of the settlers had the skills and experience required for the complex task of running a modern mixed farm,

many had gone heavily inot debt. Hence, most African-owned large-scale farms have deteriorated since their change of ownership in terms of:

a) Dilapidated buildings, dips and fences
b) High mortality among the livestock
c) Heavy drops in crop yields
d) Deterioration of farm machinery
e) Misuse of land and pasture and bush encroachment

Despite this scenario, the settlement schemes still perform better in terms of the crop production compared to the African reserve areas.

3-6 Economic activities from 1966-1974

The white settlers used to practice dairy farming as the main economic activity. At this time, the area was well served with a good infrastructural network (roads, water). With the settling in of Africans, there was a well planned provision of infrastructure especially access roads and water supplies. However, not much attention was paid to these infrastructure later on. Therefore, with time, the infrastructure started deteriorating. With the dairy industry, there was a milk processing plant, the Kenya co-operative creameries at Sotik. The creamery gave a lot of incentive to the farmers by way of increased income and employment.

Despite dairy farming being the dominant activity, the area had very good agricultural soils (deep and black loam soils). Therefore, farmers grew crops such as maize, beans, finger-millet, peas. The real difference was that besides dairy farming, the settlers had

practiced large scale commercial farming. The incoming African settlers had small and medium scale holdings but encouraged to continue with commercial farming. These crops formed the main food crops. They also could sell the surplus to earn income which they could use in educating their siblings and meeting other basic necessities such as clothing and shelter. At this time, the rate of population growth was approximately 2 per cent per annum and was seen to be quite low compared to other parts of the district. However, it impacted on the rate of land sub-division and therefore the average farm size per household.

Between 1974 – 1984

This period saw the introduction of various cash-crops, first pyrethrum and then tea. Pyrethrum was grown by many of the farmers but tea was adopted by a few farmers. However, it was not long before other farmers adopted the growing of tea both small scale and large scale. Due to the areas under tea coupled with the high production, and the untapped potential, Nyansiongo tea factory was established in 1974 to cater for this.

Despite this great step forward, due to poor maintenance and neglect, the initial infrastructure network had deteriorated. Instead of the piped water supply, people were now fetching water from the streams. The murram roads were washed away by rainfall and hence were in a bad state. This forced the farmers to experience extreme difficulties in transporting farm produce to markets. The period was characterized with a higher population growth rate of 2.5 per cent (1979 census) caused by natural increase and largely by immigration. This aspect led to further land sub-division which meant smaller farm holdings per household.

Between 1985-2000

The tea industry in Borabu is more established with 39 buying centres distributed all over the division. This factor has contributed to an increase in employment. During this period, the dairy industry showed signs of decline due to poor management. This factor caused many farmers to turn to tea growing. The growing of pyrethrum which had begun to decrease, is now picking up due to the high price for the crop of about Kshs. 140.00 per kilogram (Field survey, 2000). For the sake of the paper, we will now zero in on Nyansiongo tea factory, describing its history to date. Today, the population grows at 2.16 per cent per annum. A number of households are not selling their land to outsiders because they have come to attach great importance to the property especially following the high population growth rate and deteriorating soil potential over the ages.

3-7 History of Nyansiongo Tea factory

Nyansiongo tea factory was established in 1974 by the Kenya Tea Development Authority (K.T.D.A). It was the third factory in Kisii district after Nyankoba and Kebirigo. Its construction was necessitated by the increased output of tea in the settlement scheme occupying Borabu division. It was purposely constructed to relieve congestion in the other two existing factories too.

Nyansiongo tea factory was easily established due to the increased tea farming activity in the division,availability of plenty of land, proximity to the transnational road, conducive soils as well as climate. The factory has a capacity 15 million kilograms of green leaf per year but has never handled such a capacity since its establishment in 1974. The actual

weight keeps on shifting each passing year. This type of variation, is mainly caused by change of climate, effects of frost among others.

Table 3-4: Green leaf production 1995-1999

Year	Factory Weight
1995/1996	11,285,622
1996/1997	9,045,129
1997/1998	14,163,602
1998/1999	8,968,622
Total	**43,462,986**
Average	**10,865,747**

Source: Factory Annual Reports, 1999

The factory today has a total capacity of 300 operatives. It has contributed to the development of Borabu division in terms of infrastructure employment and income. However, the factory is limited in the role that it plays in Borabu's development. As seen on table 3-1, the factory operates below capacity, a factor that limits the extent of its impact on the development of the division. This is evident in the total income accruing from the factory and the labour employed, both of which are limited.It is the purpose and aim of this study to unravel these limitations and then suggest possible recommendations that could be adopted to realise fully the development of the division.

3-8 Social-economic profile

3-8.1 Farming

Farming is the main economic activity in Borabu. Farmers practice both subsistence and cash-crop production such as tea, pyrethrum, maize, beans, fingermillet, bananas. The

agricultural produce is for household consumption as well as for sale. Borabu division has the largest share of large scale farmers in Nyamira district. A major portion of the divisions income is derived from tea. Tea as a crop has maintained a high average yield per hectare compared to the other crops over the years (table 3-5 and 3-6).

Table 3-5: Crop production Trends (1991-1995)

Crop	Average Yield (1000 tonnes)	1991	1992	1993	1994
Tea		7.5	7.0	7.4	6.9
Maize		3.8	3.2	3.2	3.1
Beans		0.8	0.5	0.9	0.7
Sorghum		1.1	1.1	1.2	1.2
Fingermillet		0.9	0.8	1.0	0.9
Coffee		1.9	1.7	2.4	1.7
Pyrethrum		0.8	0.8	0.5	0.7

Source: Field Survey, 2000

Table 3-6: Crop Income Trends-1991-1994

	Income in million kshs			
Year	1991	1992	1993	1994
Tea	150	140	148	138
Maize	57	48	48	46.5
Beans	40	25	45	35
Sorghum	22	22	24	24
Finger-millet	45	40	50	45
Pyrethrum	112	112	70	98

Source: District Agricultural Officer, Nyansiongo, 1999.

Given that maize takes the highest proportion of land under crops (57%) and yet it yields less returns in terms of income and production as compared to tea, then there is every reason to increase the acreages of tea so as to increase the income even more.

Fishing is not a significant activity in the area. However, farmers are being encouraged to take fish farming so as to increase the levels of income as well as avail proteins to their diet. The main crops grown are maize, tea, pyrethrum, finger-millet and beans (map 3-6). Despite the fact that maize is largely grown by the people, it still maintains a less average yield per hectare (ref. table 3-5).

3-8.2 Trade and Commerce

The principal driving force of commercial activities in the district consists of earnings from tea and maize. Nyansiongo (Kijauri) is the major trading centre in the area. The growth of small market centres such as Manga, Matutu, Riamanoti has attracted retail and wholesale markets for farm produce, stimulated growth of cottage industries and created demand for goods produced. The informal sector has however become common and employs a big percentage of the population (see plate 3-1).

3-8.3 The Manufacturing Sector

The main processing plant in the division is the Nyansiongo tea factory. Within the rural and market centres in the division, there are also other small scale industrial enterprises such as carpentry workshops, bicycle repair, shoe repair, welding, motor garages, posho milling and informal selling of second-hand items. The tea factory has been a propeller of other industrial activities in the division for instance posho-milling, welding, jua-kali,

retail businesses which are located near the factory. However, it has been weak in provision of social services such as education and health even for its own workers.

Plate 3-1: Informal selling of second-hand clothes

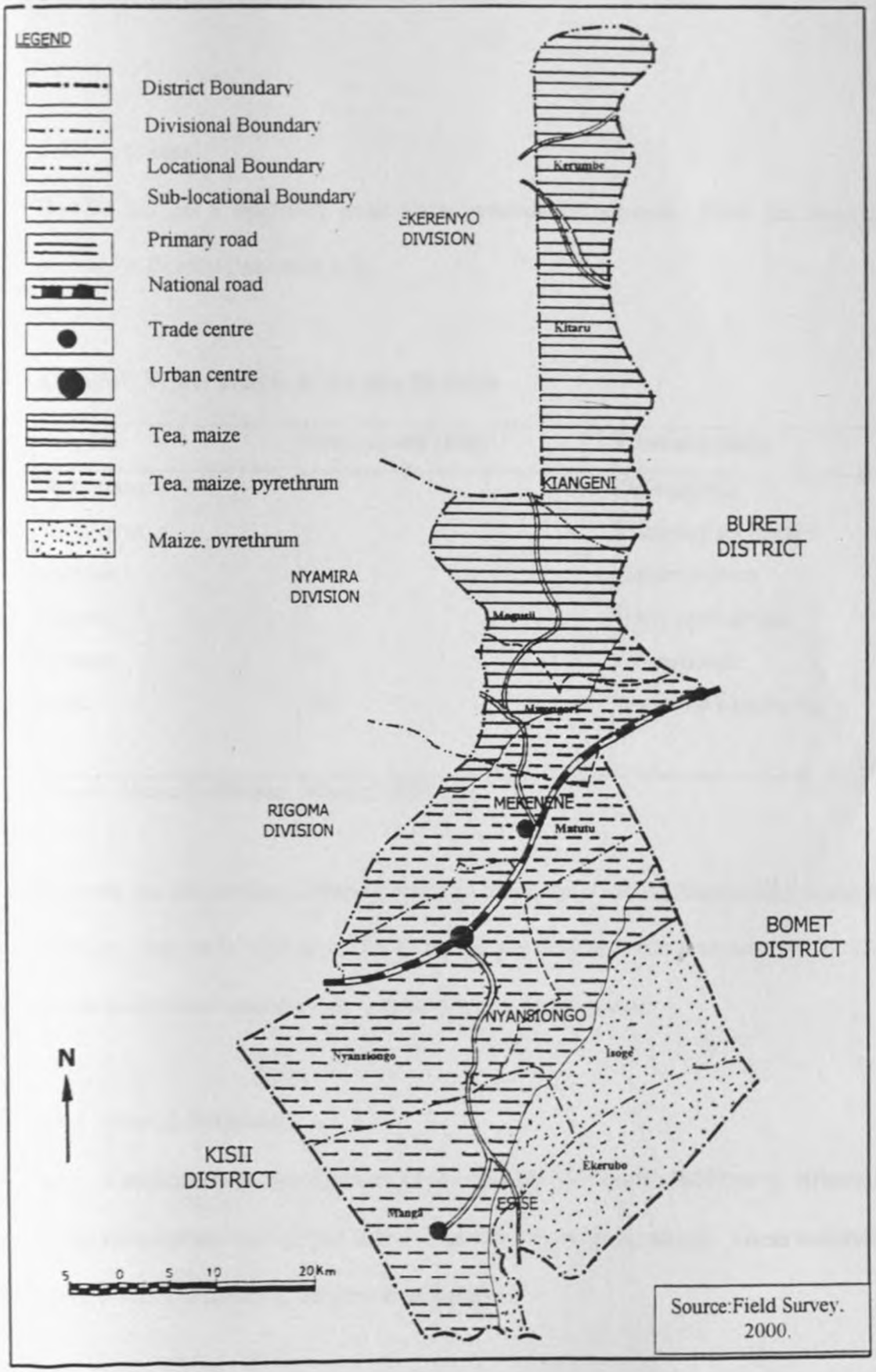
Source: Field Survey, 2000.

3-9 Infrastructure Services

3-9.1 Roads

The division is well served with murram roads of class c (see map 3-7). However, some of these roads are in very poor conditions as shown on the map. The state of these roads contributes to the state of development in the area. The division is dissected by a trunk road, the Kisii-Sotik road (class B). This increases the degree of interaction and transferability between the division and other areas thus providing more opportunities for development.

Map 3-6: Crop distribution



3-8.3 Water

Borabu has got a relatively good water reticulation network. There are several water projects in Borabu (see table 3-7).

Table3-7: Water supply in Borabu Division.

Project	Area served (km)	Current status
Nyansiongo	12	Operational
Menyenya	1	Pumping set needed
Gesima	1	Rehabilitation
Matutu	5	Party operational
Eronge	12	Operational
Sotik	298	Awaiting contracting

Source: Ministry of Water, Nyamira, 1993

The area has got several permanent streams which serve the population all the year round. However, the aim to avail water for all by the year 2000 has not been achieved because the people sometimes walk for three kilometres to a water source.

3-8.4 Health Facilities

Many Stakeholders in development have come up with health facilities at various levels. These stakeholders include the church, individuals, the government. These facilities have brought services closer to the people of Borabu.

Table 3-8: Health Facilities in Borabu

Facility	Numbers
Health centres	4
Dispensaries	5
Sub-Dispensaries	1
Total	**10**

Source: Field Survey, 2000.

The number of health centres is adequate but the problem lies with their distribution whereby some people walk for over five kilometres to a health centre. The health centres are not evenly distributed. The three health centres are located at Nyansiongo urban centre. However, the dispensaries and sub-dispensaries are scattered all over the division. The health centres are located in Nyansiongo because of the economies of agglomeration and also due to centrality enjoyed by the centre.

3-8.5 Educational Facilities

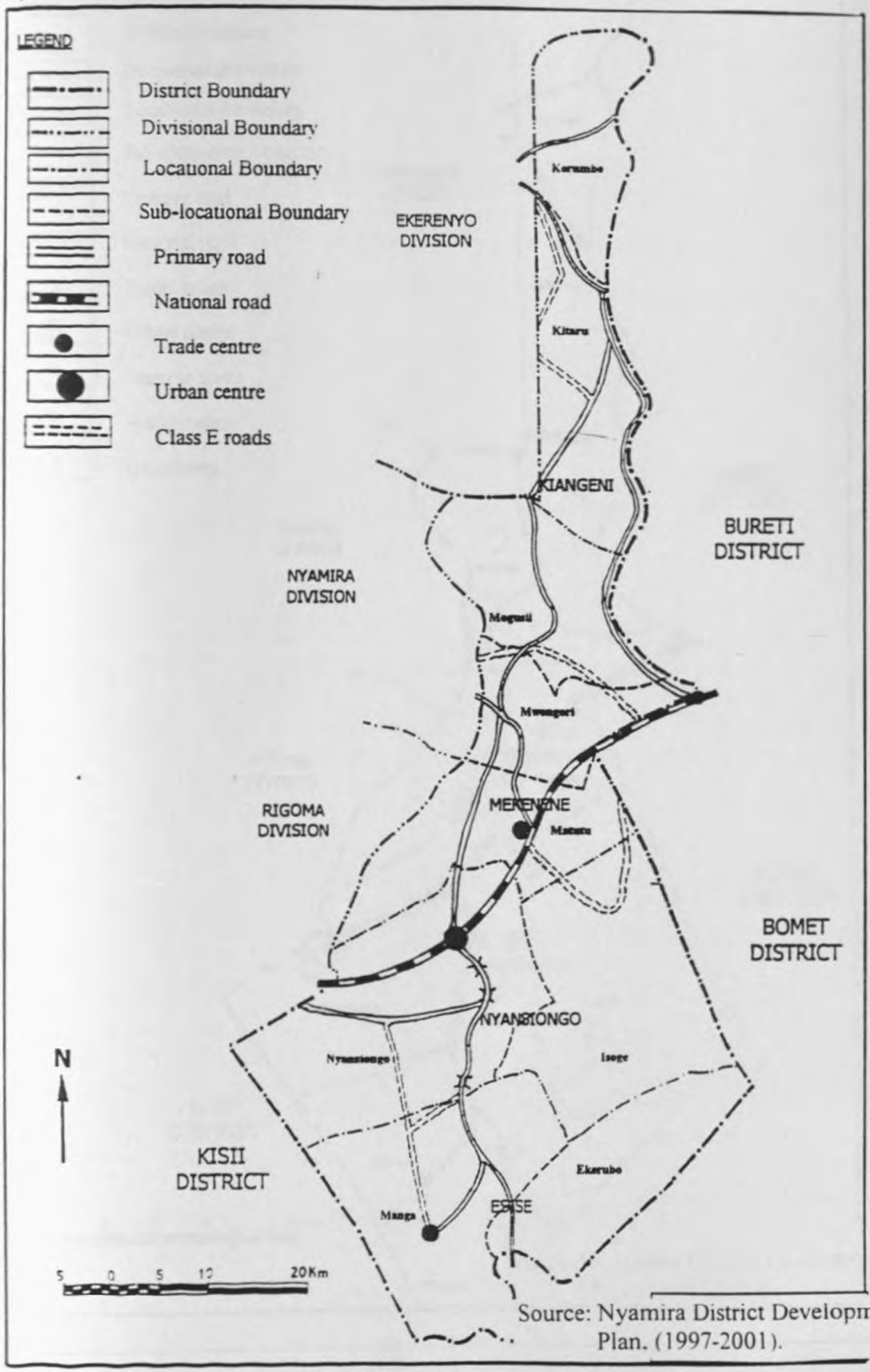
Educational facilities are evenly distributed within the division. At least each location has a primary school and a secondary school within walking distance of two kilometres. The educational facilities are:

Table 3-9: Educational Facilities in Borabu

Educational Level	Number	Enrollment
Pre-Primary	50	1855
Primary	47	12229
Secondary	11	3628
Youth Politechnics	2	144
Total	**110**	**17858**

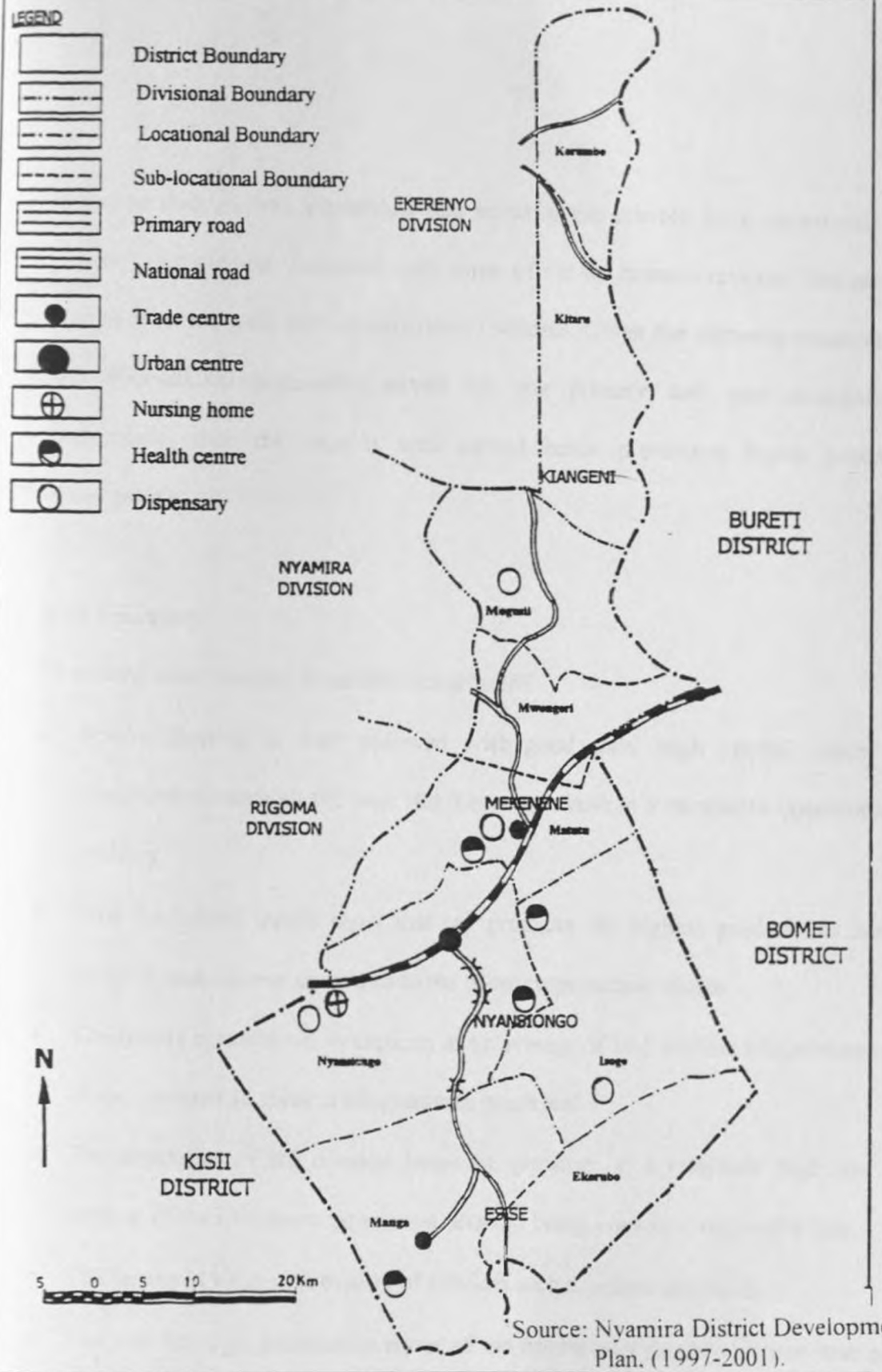
Source:D.E.O. Nyansiongo,2000.

Map No. 3-7: Roads



Source: Nyamira District Development Plan. (1997-2001).

Map No. 3-8: Distribution of health facilities



Source: Nyamira District Development Plan. (1997-2001).

From the study, it was established that some of the schools were constructed from the parents' own account. Interview with some of the tea farmers revealed that part of their income from tea went into construction of schools. Given the planning standards of 5000 and 8000-20,000 population served by one primary and one secondary school respectively, then the area is well served hence presenting higher potentials for development.

3-10 Summary

Therefore, what emerges from this background?

- Borabu division is well endowed with good soils, high rainfall which is well distributed throughout the year. All these contribute to a conducive conditions for tea growing.
- Crop production trends show that tea produces the highest produce per hectare in terms of cash income compared to the other crops such as maize.
- The factory operates below capacity at an average of 10.8 million kilogrammes instead of the expected 15 million kilogrammes green leaf.
- The population of the division keeps on growing at a relatively high rate mainly because of the immigrant population, Borabu being a newly resettlement area.
- The factory is weak in provision of services such as education, health.
- The area has high potential in terms of the natural and human resource base such as soils, drainage, topography, climate, agro-ecological zones. The social and physical infrastructure provide even more potential into the division. The question which remains is that, is this potential being utilized adequately for development?

CHAPTER FOUR

EXPENDITURE PATTERNS OF TEA FARMERS IN BORABU DIVISION

4.0 Introduction

Having established that tea yields higher average returns per unit area as compared to other crops, this chapter goes deeper to give an analysis of the expenditure patterns of tea farmers in Borabu as well as the problems that the farmers experience. The pattern of expenditure is assumed to lead to further development of the division. The analysis in this chapter reveals further linkages associated with the tea industry. These have got to do with the distribution of the income that the farmers get after selling their tea. Chapter five gives an analysis on the backward and forward linkages of the tea production process using the tea factory as a basis for analysis. Problems experienced at various linkage points are also analyzed.

In order to examine the expenditure patterns of the tea farmers, a sample of 20 farmers was taken whereby their expenditure from tea were established. The expenditure patterns portray how the farmers distribute their income.

4-1 Income and Expenditure

The income levels of a people often do determine the standard of living of the same. However, the expediture patterns may give a completely different picture. Therefore, this research focuses on the expenditure patterns of the tea farmers more specifically because of this reason. Household characteristics and other activities of the people determine the pattern of expenditure. Hence, this section will dwell on these aspects

4-1.1 Household characteristics

4-1.1.1 Household size

Households in Borabu are of the nuclear and extended type. They range from three to nine members as shown in table 4-1.

Table 4-1: Household Size

Household size	Frequency	Percentage (%)
3 members	2	10
4 members	2	10
5 members	6	30
8 members	8	40
9 members	2	10
Total	**20**	**100**

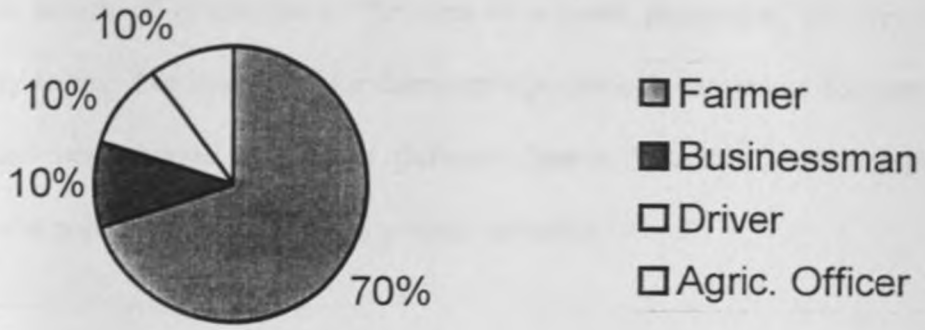
Source: Field survey, 2000.

Fifty per cent of the households have got five members or less whereas 50 per cent have 8 members or less. The average household size is six members. Considering that the mode size is 8, then we can conclude that the households in the division are generally large.

4-1.1.2 Occupation of the Household Head

The occupation of the household head gives an implication of the socio-economic life of a people as well as the standard of living of the people. The following figure provides the occupational structure of the household heads which vary as follows (Fig. 4-1).

Fig. 4-1: Occupation of Household Heads



Source: Field Survey, 2000.

Therefore, a majority of households in Borabu are farmers, followed by wage employees. Farming therefore can be said to be the driving force behind economic development in the division, hence the more reason as to why we should plan for it.

4-1.1.3 Distribution of Age Groups

The age groups in Borabu are distributed as follows.

Table 4-2: Age Groups in Borabu

Age group (yrs)	Percentage
0 – 9	13.8
10 – 19	20.0
20 – 29	35.4
30 – 39	18.5
40 – 49	6.2
50 +	6.2
Total	100.0

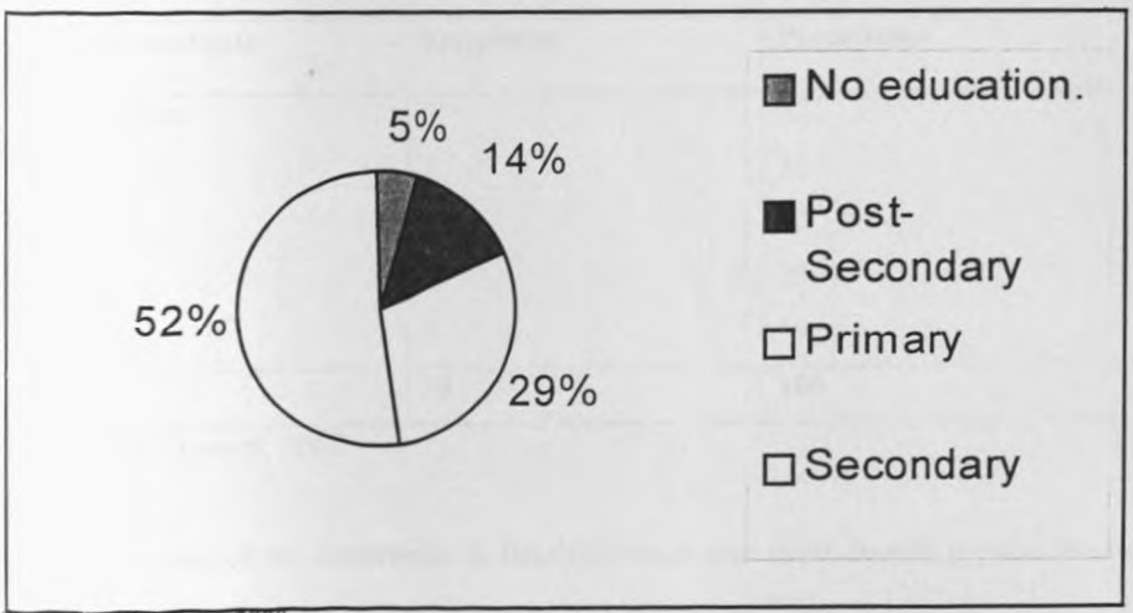
Source: Field survey,2000

Sixty-nine per cent of the population lies below age 30 whereas 34 per cent of the population is between 0 and 19 years. This table presents a high dependency ratio, a strong work force and many people in search of employment. The ages of a given population are very crucial in planning for any region. For instance if the dominant age group is say below 35 years then this factor alone has implications on service delivery (health, education) to this population. Therefore, Borabu population is generally a young population

4-1.1.4 Literacy Levels

Literacy is a measure of the standard of living. It is assumed that attaining a certain minimum level of literacy contributes to the welfare of a given society. In Borabu, the literacy levels were as follows.

Fig. 4–2: Literacy Levels of Borabu Division



Source: Field Survey, 2000

A majority of the adult population (66%) have attained secondary school level or beyond. Therefore, the population presents a literate people who can be gainfully employed in development. Only 5 per cent of the adult population have recieved no education. We may therefore say that 95 per cent of the population of Borabu are literate given the literacy level provided by the welfare monitoring survey II, (1994) as being primary level.

4-1.1.5 Household Dependants

Within each household, there are dependents who depend on the household in one way or another for their livelihood. However, some households portrayed that they do not have any dependant either because they were old parents who did not have small children or did not employ any worker on the farm.

Table 4-3: Household Dependants

No. of dependents	Frequency	Percentage
No dependant	5	25
1	7	35
2	2	10
3	4	20
5	2	10
Total	**20**	**100**

Source: Field survey, 2000

Seventy per cent of the households in Borabu have at least three dependents and this represents the highest percentage. A minority (30%) have three or more dependants. The reason for this is that a majority of the households have young children. The number of dependants in any given

household portrays the stage in development. It is assumed that a more economically empowered household is able to host several dependants. The vise versa is also true. Therefore, we may conclude that Borabu division is developed to a certain extent.

4-1.2 Farm Activities

4-1.2.1 Size of Farm Holding

Borabu Division is the largest division in the District in terms of area (238 km^2) and the least densely populated. The reason for this being that it is a newly settled area compared to the other divisions. However, from the field survey, the following information was collected.

Table 4-4: Size of Farm Holding Per Household

Farm size (ha.)	Frequency	Percentage	Av. Farm size
2.5	4	20	
3.5	2	10	
4.0	2	10	
5.2	2	10	
12	2	10	
18	2	10	
20	2	10	
30	4	20	
Total	**20**	**100**	**12.32 ha.**

Source: field survey, 2000

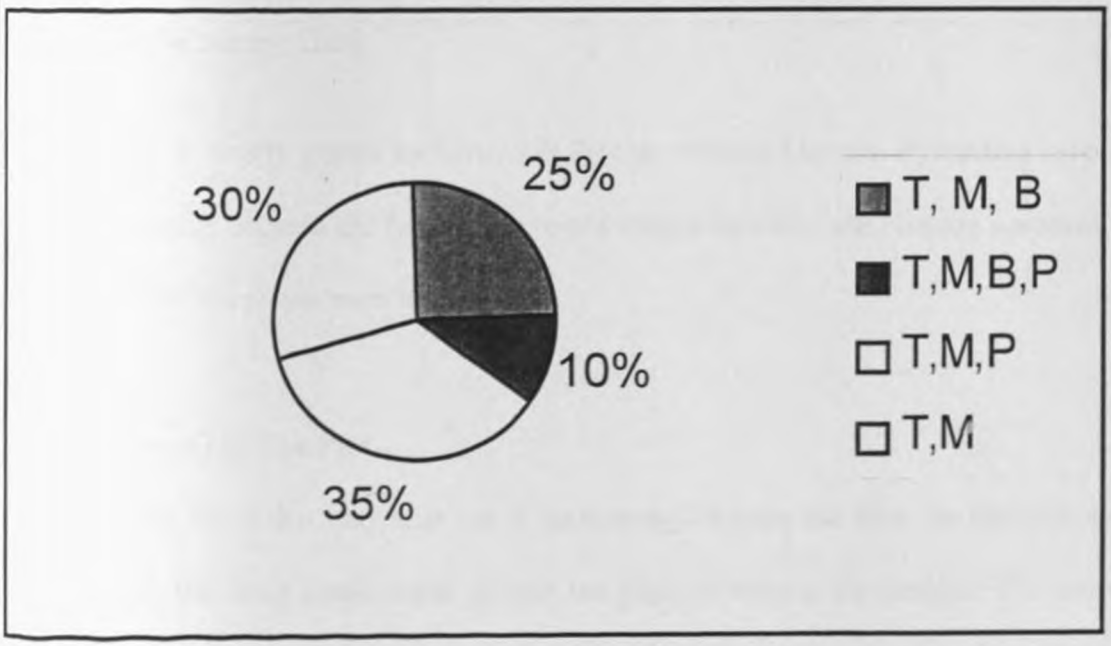
Fifty per cent of the households own less than 5.2-hectare farms. Another 50 per cent occupy farms ranging from 12 to 30 hectares. The small farms have come up due to the high rate of immigration. The large 30 acre farms have persisted through the ages because the owners have

been stubborn and not ready to sell their land to other people. However, the average household size is 12.32 hectares.

4-1.2.2 Dominant Crops Grown

As established earlier on, a majority (70%) of people in Borabu are farmers. These farmers practice mixed cropping such that at no one time will you find a farmer growing only one crop. Apart from tea, there are other crops grown (Field Survey, 2000). The various percentages were compiled. The dominant crops grown in various combinations are; maize, tea, beans and pyrethrum.

Fig. 4-3: Combinations of Crops Grown in Borabu Division



KEY:
T=Tea
M=Maize
B=Beans
P=Pyrethrum
Source: Field Survey, 2000

The combination of tea, maize and pyrethrum presents the highest score (35%). Inquiring deeper the respondents said that they grow pyrethrum as a supplement cash crop because it is currently fetching a higher price (Kshs.140.00 per kilogramme) than tea. Tea is the main cash crop while maize is the main food crop though the surplus is sold for cash. However, computing the various acreages under the various crops, the results as follows (table 4-5).

Table 4-5: Area Under Dominant Crops

Crop	Area (acres)	Percentage
Maize	86	56.6
Tea	36	23.7
Beans	18	11.8
Pyrethrum	12	7.9
Total	**152**	**100.0**

Source: Field Survey, 2000

Maize crop is largely grown by farmers in Borabu followed by tea. Pyrethrum accounts for the least percentage because the farmers are re-planting it currently after having uprooted the crop in the past when the prices went too low.

4-1.2.3 Size of the Tea Plot

To avoid the errors that may arise out of computing the gross tea area, the research endeavoured to establish the exact areas under various tea plots in various households. The sizes varied or ranged between 0.25 acres to five acres as shown below.

Table 4-5: Different Sizes of the Tea Plot

Plot sizes	Frequency	Percentage
0.25	2	10
0.5	1	5
1	5	25
2	2	10
3	4	20
4	4	20
5	2	10

Source: Field Survey, 2000.

Twenty-five per cent of the household interviewed own 1-acre plots under tea. This represents the highest percentage. However, the tea plots are generally small. The explanation for this was that the people of Borabu are not classified as 'poor' people. Therefore, they have not attached great significance to the tea crop as a major source of income. However, calculating the average area under a tea plot, the result is 1.88 acres. Therefore, the ratio between the size of the tea farm to that of a household farm is 1: 16. On the average, there is one acre under tea for every 16 acres of total farm area in the division.

Testing further to find out whether the size of the tea plot is related to the total farm size, a correlation was run. The results show that R^2 is equal to -17.12 per cent which is significant at 0.001. Therefore, the size of the tea farm declines with increase in the total farm size. This confirms further the fact that the people of Borabu have still not recognized the tea crop as a high value cash crop and therefore a major source of income.

4-1.2.4 Green Leaf Production

The production of green leaf per month varied from one household to another ranging from 100 kilogrammes to 1500 kilogrammes as shown below.

Table 4-6: Green Leaf Production Per Month

Green leaf (kg)	Frequency	Percentage
100	2	10
300	4	20
260	2	10
600	2	10
1000	4	20
1200	2	10
1500	4	20
Total	20	100

Source: Field survey, 2000

These data show that the amount of green leaf produced per month is varied. The variation is explained by such factors as good husbandry practices such as for households that are harvesting up to 1500 kg of green leaf. The average volume of green leaf produced per month per household is 772 kilogrammes. Is the volume of green leaf related to the size of the tea farm ? Correlating the volume of green leaf per month and the size of the tea farm per household, the outcome was a weak asssociation of 0.48 per cent at 0.001 significance level.

These results reveal a weak association between the volume of green leaf produced and the size of the tea farm. That several other factors such as crop husbandry practices explain the reason

why the existing volume of green leaf. Going deeper, to calculate the average volume of green leaf per acre in Borabu,. The survey revealed the following results:

Table 4-7: Green Leaf per acre

Green leaf/acre (kg)	Frequency	Percentage	Av. Green leaf per acre
100	3	15	
150	4	20	
250	1	5	
300	8	40	
333	4	20	
Total	**20**	**100**	**244 kg/acre**

Source: Field Survey, 2000

This production of green leaf per acre in Borabu is less compared to the national standard set by K.T.D.A at 300 kilogrammes per acre per month. The volume of green leaf per unit area is not just enough because a farmer could own a large tea farm but with very few tea bushes, a factor that leads to less tea produced. Given that the average green leaf production per month in the division is 244 kilogrammes per hectare and the standard plant population is 7185 per hectare, then for Borabu, the average green leaf production per bush is 84 grammes.

4-1.3 Revenues From Tea

The income from tea per annum per household varies from about Ksh.50,000.00 to about kshs. 200,000.00

Table 4-8: Tea Income Per annum

Income (Ksh)	Frequency	Percentage	AV. Income/year
50, 000	8	40	
50.001-100,000	2	10	
100.001-200,000	7	35	
200,2000	3	15	
Total	**20**	**100**	**110,000.00**

Source: Field Survey, 2000

A majority (40%) of households get income of less than or equal to Ksh.50,000.00 per year. Correlating the tea income per year with the size of the tea farm, the results show that there is a weak association of 0.204 percent at 0.001 significance level.

There is a weak association of 4.52 per cent between the two variables. That the size of tea farm does not on its own necessarily determine the amount of income. This is explained by the fact that some farmers do not follow the standard spacing between the tea bushes and also poor husbandry practices (see plate 4-1) such as lack of prunning. The end result of this is low production of green leaf hence poor or low returns.

In order to establish whether the amount of tea income determines the number of farm workers in a household, a correlation was run between tea income and the number of farm workers. The results show a weak though significant association of 0.37 per cent at 0.001 significance level. The number of workers to a large extent (over 99 per cent) does not explain why there is that amount of income. The workers could be many but the quality of their work done poor.

4-1.4 Expenditure of the Revenue From Tea

The various expenditure patterns of each sampled tea farmer were examined. It was established from the field survey that the income from tea induces other multiplier effects within and outside the division in form of the expenditure patterns. The overall expenditure patterns are as shown below. The sampled tea farmers revealed the following expenditure patterns.

Fig. 4-9: Expenditure Patterns of Tea Farmers.

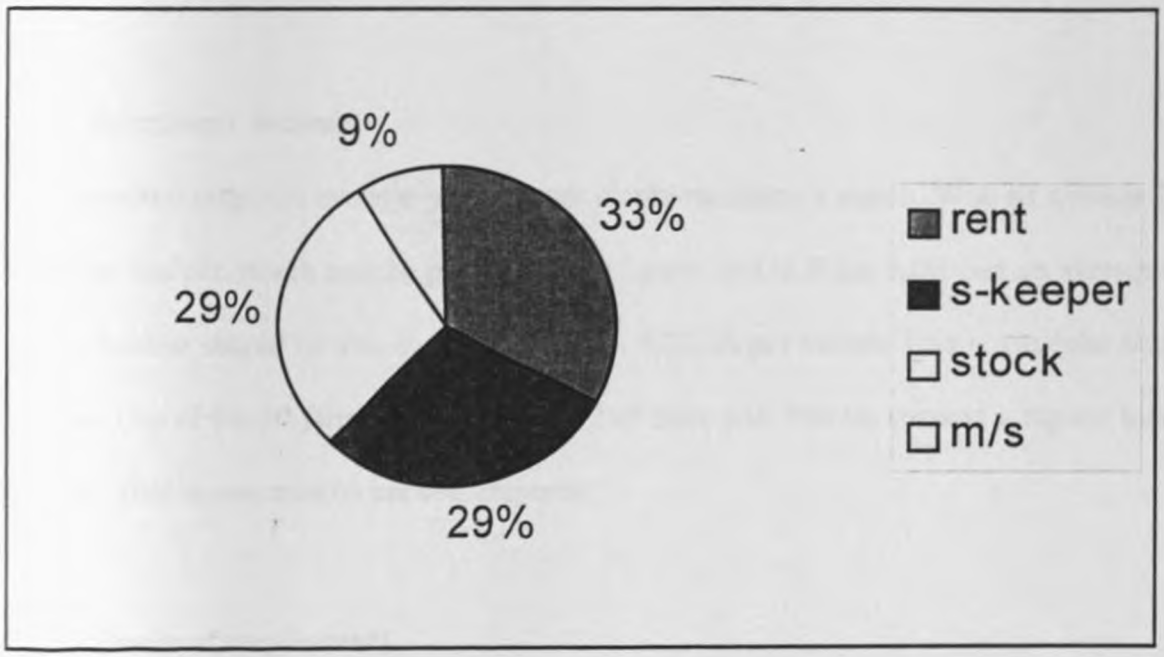
Expenditure/year	Amount (kshs.)	Percentage
Wages	280,000	20.4
Farm inputs	293,920	21.4
School fees	578,000	42.1
Food & clothing	148,000	10.8
Health	3,000	0.2
Savings	17,000	1.2
Business	41,000	3.0
Household	13,000	0.9
Total	**1,373,920**	**100.0**

Source: field survey, 2000

The highest expenditure goes to education. This implies that the people of Borabu value education very much. It also coincides with the high literacy levels in the division. Tea farmers also spend a good amount on wages and farm inputs because this ensures a sustainable income from the crop. The least expenditure goes to health (almost insignificant). The reason for this is not because people do not fall sick but it is likely to be due to the limitation of the questionnaire as a tool for data collection. The respondents did not view their expenditure on health as important or as a form of expenditure.

In order to reveal other multiplier effects from tea, the expenditure on business which takes 3 per cent was picked out and the results showed that the highest expenditure was on rent followed by the shop-keeper's salary and purchasing of new stock. These expenses are viewed as other multiplier effects induced by the tea income.

Fig.4-9: Multiplier Effects



Source: Field Survey,2000.

Throughout the production process, tea as a crop has got advantages and disadvantages. As experienced by the farmers, the main advantages were as follows.

4-2 Effects of Tea Production in Borabu.

The effects of tea production in Borabu are viewed in terms of advantages and disadvantages. The advantages are seen as representing the positive effects or the strong linkages while the latter represents the negative or the weak linkages. These have been discussed as follows.

4-2.1 Advantages of growing tea

The advantages have been outlined under various sub-sections.

4-2.1.1 Permanent income

Tea is a perenial crop. On average, a tea farmer plucks tea thrice a month. With an average 244 kg of green leaf per month and the price of 1 kg of green leaf at Kshs. 6.00 then an average tea farmer in Borabu should be able earn at least Kshs. 4392.00 per month. This is a regular source of income. Out of the 20 farmers interviewed, 13 of them said that tea ensured a regular source of income. This represented 65 per cent response.

4-2.1.2 Source of employment

A tea farmer on average in Borabu employs three workers to work on his/her farm on a permanent basis though many either decide to pull out and look for work elsewhere or retire back home. Additionally, the family members especially sons and daughters get employment at the farm. There was a ten per cent response that the tea crop was a source of employment.

4-2.1.3 Ready market

The ready market (factory) within the division makes it even more viable to grow the crop. The ready market reduces expenses such as on transport and therefore ensures higher returns.

4-2.1.4 Collateral for credit/loan

Tea as a crop can be used as collateral for loan. The tea farmers can request for loans from the Chai Co-operative bank which can be a basis for further developments.

4-2.1.5 Induce multiplier effects

The total income that accrues from tea induces other multiplier effects through the expenditure patterns of the tea farmers and other employees at the farm. From Figure 4-7, it is evident that the tea farmer saves some amount equivalent to 1,2 per cent and spends the rest on various aspects such as payment of workers, education,health, business among others.

4-2.2 Disadvantages of growing tea

The disadvantages have also been discussed under various sub-topics.

4-2.2.1 Labour intensive

Tea as a crop is labour intensive. It requires close attention right from plant propagation through weeding, harvesting, transportation and processing. This denies time for other crops. The highest response (25%) of farmers quoted the problem of labour intensiveness.

4-2.2.2 Natural calamities

Tea reacts immediately to natural calamities such as draught and hailestones or frost. The returns are directlty affected by these calamities. When the proceeds are affected, then this also affects other multiplier effects.

4-2.2.3 Price fluctuation

Depending on the total green leaf produced and the international market price demands, the price on the green leaf fluctuates. This has an impact on the farmers' programmes.

4-2.2.4 Transport and communication problems

There was a 100 per cent response that the farmer transports his green leaf to the buying centre by head-loading. The reason for this is due to poor road conditions in some parts of the division. (plate 4-2). Hence even the factory vehicles which collect the leaf from the buying centres have a problem in accessing the centres. This results into time wastage at the buying centre, time which could have been utilized in other useful activities. It also causes a reduction in leaf quality hence low returns.

4-2.2.5 Lack of transparency

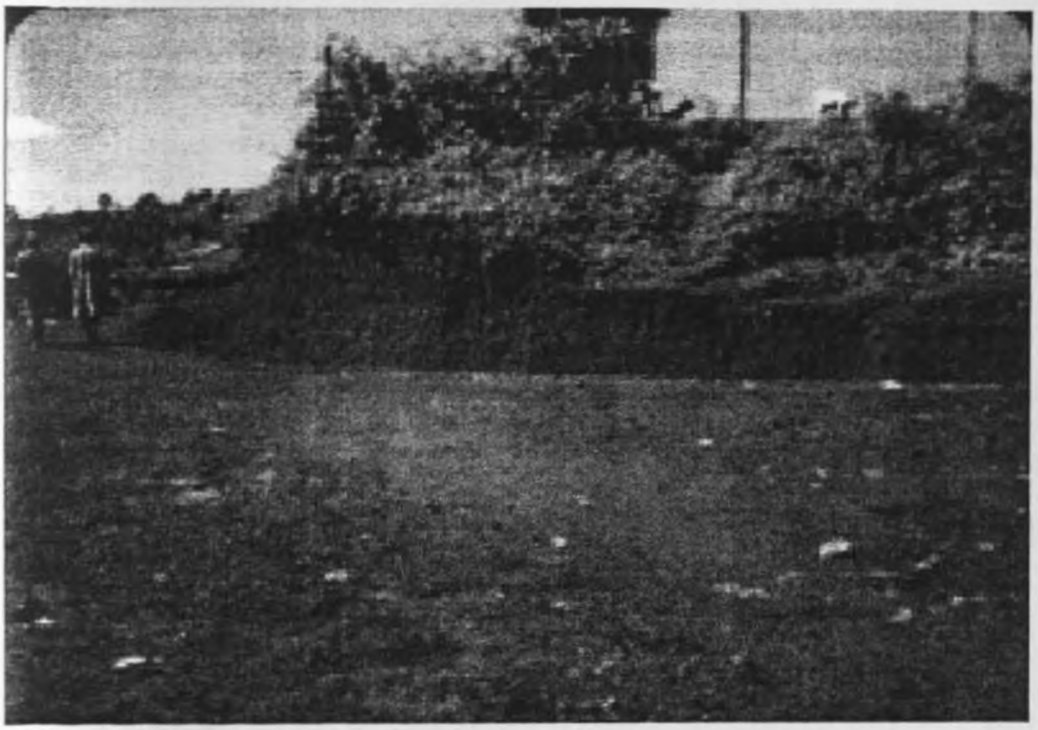
Ten per cent of the farmers confirmed that there was corruption at the buying centres due to the malpractices of the leaf clerks. This practice was seen to affect the total proceeds from tea.

4-2.2.6 No intercropping

Tea is a sensitive crop which requires careful attention. It requires standard spacing and no intercropping. With the population growth rate at 2.16 %, there is a definite decrease in land per

household in future. This is however a problem which can be solved by ensuring maximum tea bushes per unit area. Coupled with the land issue then the problem of no intercropping is surely present.

Plate 4-1: Poor road conditions



Source: Field Survey,2000.

4-2.2.6 Inadequate Labour

Sixty per cent of the farmers do not have adequate labour. This issue came out prominently in the problem list done by farmers.

4-2.2.7 Poor Fertilizers

Before the liberalization of K.T.D.A., farmers enjoyed the supply of fertilizers through the fertilizer credit scheme. The complaint by the farmers is on the high prices charged on this commodity. Additionally, the quality of these fertilizers was very poor. However there seemed to be hope for things to change for the better under the new management.

4-3 Summary

This sub-section provides an overall summary of the main findings from this chapter. They have been discussed under different sub-topics.

4-3.1 Demographic Characteristics

The households in Borabu are generally large with the average household size of six members. 69 per cent of the population lie below age 30 which means that it is generally a young population representing high dependency levels, a strong work force. 62 per cent of the adult population have attained secondary level education, hence high literacy levels.

4-3.2 Farm Activities

Farming is the main occupation of people in Borabu. There are small, medium and large farms in the division. The large farms have persisted over the ages irrespective of the effects of immigration as established in chapter three. The farmers concerned have been resistant to selling out their land to the immigrant population. This is attributed to the Gusii culture too which does not allow for the selling out of land to outsiders especially members of other tribes.

4-3.3 Dominant Crops

Maize is the most dominant crop grown in the division followed by tea. This situation is explained by the fact that maize serves two purposes for the local community; a food crop and sometimes as a cash crop. It is also the staple food for the people.

4-3.4 Tea Production

Tea production in the division is far much less than the standard set by K.T.D.A. For instance production per bush is 84 grammes while the expected K.T.D.A. standard is 442 grammes. This implies therefore that the division's potential is in terms of the natural endowments such as rainfall, good soils and large parcels of land among others are being underutilized. The association between tea produced and the size of the tea farm was found to be weak at 0.48 per cent. However, the size of the tea farm was found to decrease with increase in total farm size.

4-3.5 Expenditure Patterns

In order to reveal the multiplier effects from tea, the expenditure patterns of the tea farmers formed a major insight into this. The farmers' highest expenditure goes to educating the children. This could be attributed to the fact that the population is basically young with a majority of people in the school going age.

CHAPTER FIVE

BACKWARD AND FORWARD LINKAGES

5.0 Introduction

The previous chapter has given an analysis of the role of the tea factory in the division at the farm level. This chapter proceeds to look at the backward and forward linkages in the smallholder tea sub-sector using the factory as the basis of analysis. Problems experienced have also been analyzed under each linkage point.

Linkage studies are concerned with identification of potential flows with the view of revealing the region's actual or potential position in terms of development. There are five types of linkages as described in chapter two. However, for the sake of this section, definitions are given on the forward and backward linkages. Backward production linkages involves moving closer to the basic raw material inputs to a production process or even to indirect inputs. For this study, the backward linkages constitute the production of tea leaves. Forward production linkages involves further processing or expanding an existing production process so that a broad array of outputs are produced. It involves further processes after the finished product has been produced. In this case, it involves packing and marketting. In examining these linkages, the attempt is to establish clearly and specifically, the role of the factory in the development of the division.

5-1 Backward Production Linkages

Having defined backward linkages, a case study of one farm was taken in order to bring out the existing scenario of the backward (production) linkages. The linkages start right from land preparation to the processing of the green tea leaves in order to produce the final product.

5-1.1 Land preparation

The tea crop requires deep, well drained and aerated soils. In oder to meet this requirement, a few inputs are required. These include hoes, rakes as well as labour. The farmers buy the jembes from Kisii town or Keroka town. This is because the implements are not available in the nearby markets and this has proved to be a constraint because of the transport expenses that the farmers incur. Labour, which is another major input is a problem in the area.

For barren land, the exercise of land preparation is even more difficult given that the soil must be dug deep. Therefore this requires heavy manual labour. The first tilling is done and the land is left to lie fallow for about two weeks to allow for the trash to rot. Then the second digging is done breaking the soil lumps further into smaller pieces after which the trash is raked and either burnt or burried in a hole. Having done this, then the land is ready for planting. The main problem is time consumed in the process of waiting for land to lie fallow for a while before the second digging. This aspect has been found to discourage many potential and practicing tea farmers in the division.Labour needed to perform this task may not necessarily be skilled but basically manual labour. The field survey revealed 60 per cent of the farmers experience inadequacy in availability of labour. The remaining 40 per cent said that although they did not have a problem as such, the available labour was very expensive.

5-1.2 Planting

There are two types of planting tea; from vegetative propagation and from seedlings. Farmers in Borabu employ planting from seedlings. The seedlings are obtained either from the factory's nursery or from the farmers' own nurseries. A majority of farmers in the division prefer acquiring seedlings from their own farms. Upon obtaining these seedlings, they are either kept on the farm for a night or directly transplanted to the tea plots. Holes are first dug basing on the standard size of 3 inches by 9 inches and at correct spacing. The bags containing the seedlings are torn and placed into the open holes. The process of planting is rather demanding in terms of skills needed as well as the labour required. Skills are useful here so as to ensure proper spacing and therefore higher yields. The issue of spacing proved to be a problem in the area in that a majority of tea farms portrayed a less plant population per hectare. This encouraged the growth of weeds thus choking the tea plants hence causing a decrease in returns. This method however is disadvantagious because it takes a long period (three years) before it matures. The chances of survival are also limited for all the seedlings depending on the soil conditions. The method is also tedious and labour intensive considering the labour problem in the area.

5-1.3 Weeding

The tea crop is sensitive to any foreign plant. Therefore weeds are a problem and must be kept at bay. Young tea requires weeding four times in one year. After the third year, there is hardly any weeding because the tea bushes cover up the surface choking any weeds that come up. The process of weeding is tedious and demands a lot in terms of labour.

5-1.4 Pruning

Pruning is a process of getting rid of the old tea and ensuring that tea regenerates afresh so as to ensure more growth as well as production. After pruning no plucking is done because the bushes are first left to regenerate. This period of regeneration takes about three months before plucking can continue. The period is characterized by activities such as light weeding and tipping in. Light weeding because weeds come up as a result of the exposed soil surface. Tipping in is the practice of ensuring that the bushes maintain a certain level. This is done by plucking out the shoots which grow beyond the expected level of one metre. This exercise is performed by the hired expert or sometimes by the family members themselves. High yields throughout the life of a tea bush depend on the formation of a strong spreading frame. This is done by pruning during the early years (4 - 6 years) of a tea bush. Mature branches are pruned periodically (annually) to stimulate new growth and maintain standard height. Farmers in Borabu hire labour to carry out this task. These are specialized pruners who have developed the skill over the years. The pruners are rare and expensive such that some farmers do the pruning themselves and this has caused poor production of green leaf. In fact, some of the farmers have left their tea bushes to overgrow to unmanageable heights (Plate 5-1).

5-1.5 Plucking (harvesting)

The average volume of green leaf harvested per month in Borabu is 244 kilogrammes. Harvesting starts in the fourth year of a tea bush developed from a seedling. It is done between the prines. In Borabu, plucking is done three times a month. Fine plucking (two leaves and a bud) is emphasized in order to realize high quality tea. Inputs at this level include labour and baskets. The baskets used are obtained from the local markets though the basket sellers also buy

them from external markets such as Kapkatet in Kericho district. Therefore, the factory in a way creates market for the local people as well as the outside community. In return, it increases the income levels of the same leading to further development. This presents strong linkages. The labour used at the plot comes from the family and others are employed or hired. From the field survey, a majority of households who said that they do not employ workers on their farm, use family labour. However, there were cases whereby family labour was used alongside wage labour. Therefore, family labour came in to supplement and compliment the wage labour. Different members of the family were found to provide labour on the farm.

Plate 5-1: Overgrown tea bushes

Source: Field survey,2000.

Table 5-1: Sources of Labour

Type of labour	Frequency	Percentage
Not applicable	8	40
Hired/Casual	6	30
Family	4	20
Relatives	2	10
Total	**20**	**100**

Source: Field Survey,2000.

It is important that we also examine the kind of family labour used on the farm so as to establish up to what extent the existing work force is being utilized or whether the tea industry contributes to creation of employment in the division.

Table 5-2: Family Labour

Family members	Frequency	Percentage
None	6	30
Sons and daughters	6	30
Wife and daughters	4	20
Wife and sons	2	10
Family and relatives	2	10
Total	**20**	**100**

Source: Field survey, 2000

The highest percentage of family members engaged in provision of family labour constitutes sons and daughters. This implies that the industry contributes to generating employment for the young people. However, this scenario could also imply the existence of child labour. The wife appears in three out of the four categories and hence the most dominant contributor to family labour.

5-1.6 Transportation of green leaf from the farm to the buying centre

The survey revealed that the transportation of green leaf to the buying centres is not a problem as such because 80 per cent of the farmers interviewed said that the buying centre was conveniently located to serve them. We however cannot dismiss the significance of the remaining 20 per cent who complained of the long distance that they have to walk before getting to the buying centre. In addition, the mode of transport to the buying centre was by head-loading. This presented 80 per cent response. On arrival at the buying centre, the farmers were not happy either due to the mal-practices of the clerks. The clerks under-record the weights of the green leaf delivered by farmers. This affects the final proceeds from tea.

The delivery of green leaf to the buying centre is done mainly by employed or hired labour and this aspect affects the final proceeds from tea in that the employed workers do not put in much effort to ensure higher and sustainable returns from the same tea plots. Poorly plucked tea is not accepted at the buying centre. The person who delivers poor leaf is made to sort all over again before weighing it. Sometimes, the process of sorting takes so long that the vehicle from the factory can come and leave without collecting some farmer's leaf. This was found to discourage the farmers a great deal. The weighed leaf is then packed onto the K.T.D.A. vehicles with the assistance of the farmers or the workers who deliver the tea to the buying centre.

5-1.7 Transportation of green leaf from the buying centres to the factory

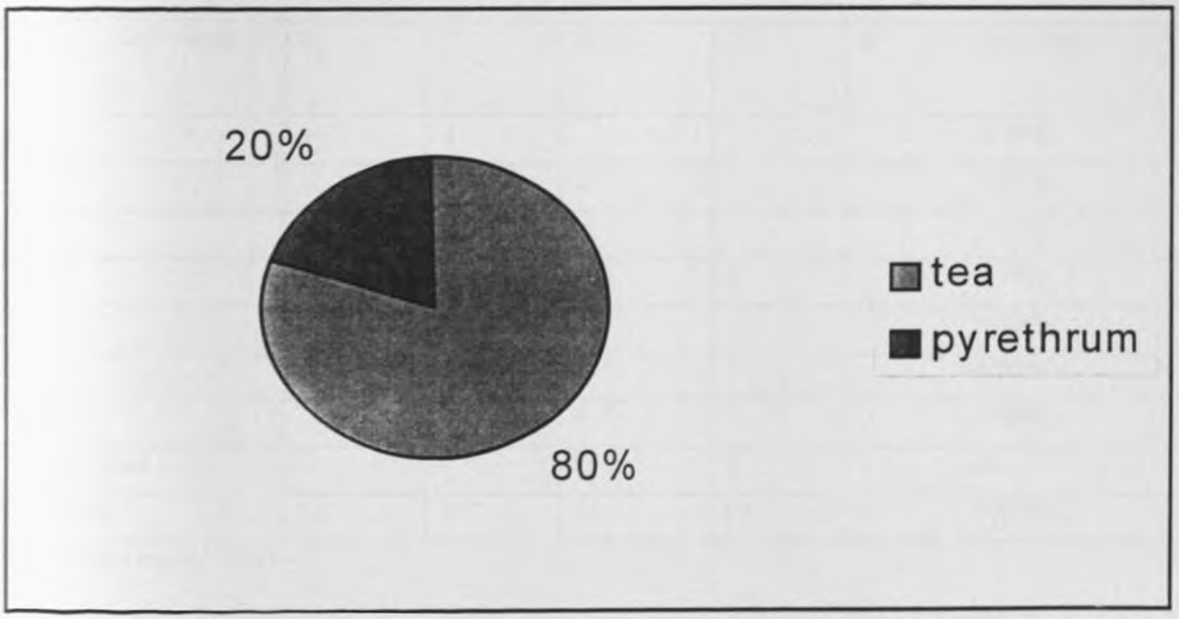
This is done by K.T.D.A. vehicles. The transportation of the green leaf is not a smooth exercise either. The tea roads under the tea roads programme are impassable in some sections especially during the heavy rains. Note that the heavy rains coincide with the flush periods. When the

vehicles get stuck, there is delay in leaf collection which leads to decrease in leaf quality and hence decrease in the final returns from tea. These present weak linkages at this level. The farmers reported cases of people having to spend long hours at the buying centres, time which could have been spent in doing other productive work.

5-1.8 Employment linkages

Tea is labour intensive. The field survey revealed that the most demanding crops in terms of labour were tea and pyrethrum. But in comparing the two, tea stood out as the leading (see fig.5-1).

Fig. 5-1: Labour – demanding crops



Source: Field Survey, 2000.

In order to meet these demands, tea farmers employ workers at times to assist in the farm activities. The survey revealed that some households (15%) did not employ a worker. While others had workers ranging between two to six workers. However, four workers stood out as the most preferred number as it scored the highest percentage (55%). But the average number of workers was 3 workers per household. Those households without workers confessed that they rely on family members and relatives to provide labour.

Crosstabulating the volume of green leaf per month by the number of farm workers per household, the results were:

Table 5-3: Crosstabulations, Volume of Green Leaf By Number of Farm Workers.

	Number of farm workers					
Green leaf/month/hh (kg)	0	2	4	5	6	Row Total
600	1	1				2/10%
300		2	2			4/20%
260	2					2/10%
600				2		2/10%
1000			3		1	4/20/%
1200			2			2/20%
1500			4			4/20%
Column Total	3	3	11	2	1	20
Percentage	15	15	55	10	5	1000%

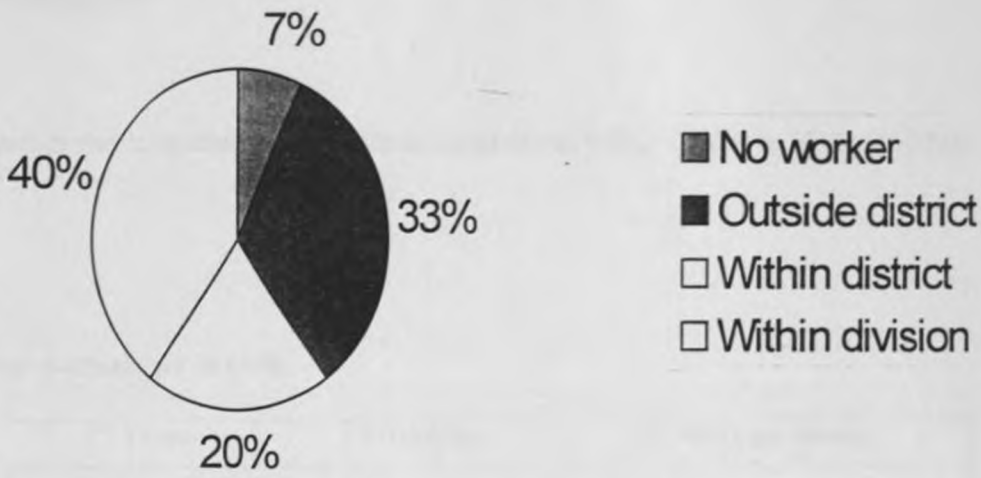
Source: Field survey, 2000

These results show that there is an optimum number of farm workers that a farmer needs to employ so as to reap maximum returns. This optimum number is 4 because this is the column where there seems to be the highest production of green leaf per month per household.

5-1.8.1 Workers' place of origin

The workers employed at the farm were found to come from different places as shown in figure 5-2.

Fig. 5-2: Workers place of origin



Source: Field Survey,2000.

The largest number of workers come from the division represented by 40 per cent. This portrays a high level of intra-regional linkages between the smallholder tea sub-sector and the division at the level of the farm. This is however closely followed by those who come form outside the district. This factor is explained by the fact that Borabu is a settlement scheme outside the district. Therefore, there is a tendency for a farmer to recruit people from his own original home, hence inter-regional linkages.

5-1.9 Income distribution

The income from tea per annum per house hold varies from about Ksh.50,000.00 to about kshs. 200,000.00. However the average income is kshs.110,000.00 per household per annum (refer table 4-8). A majority (40%) of households get income of less than or equal to Ksh.50,000.00 per annum. This is equivalent to about kshs.4,200.00 per month which represents strong linkages but which can be improved given the underutilized potential in terms of green leaf production, the natural and human resource base.

The workers employed at the farm earn wages which range from Kshs. 750.00 to Kshs. 1500.00 as shown below.

Table 5-4: Wages per worker per month.

Wage (Kshs.)	Frequency	Percentage	Av. Wage per worker
Not applicable	3	15	
750	3	15	
800	4	20	
100	4	20	
1200	2	10	
1500	4	20	
Total	**20**	**100**	**Kshs. 1050.00**

Source: Field survey, 2000

Does the amount of tea income determine the amount of wages given to farm workers ? A correlation was run and the results show that r^2 is equal to 0.1096 or 10.96 per cent which is significant at 0.001 level. This portrays a weak but significant association between the two variables. That tea income alone does not explain the wage level. An increase in volume of green leaf means an increase in wages, though at a limited percentage. Therefore, these weak but

significant linkages present the positive effects of tea growing and therefore development of the division.

5-1.10 Processing stage

The processing of tea takes place in Nyansiongo tea factory. Nyansiongo tea factory is located at Kijauri township (see map 5-1). Over the years, the division has not attained the expected maximum capacity in terms of green leaf production. As a result, the factory extends its catchment area beyond the division into other divisions of the district as shown on map 5-1. From these divisions, the factory is served by a number of buying centres (table 5-4).

Table 5-5: Buying centres serving Nyansiongo factory

Division	No. Of buying centres	Percentage
Nyamira	7	12.28
Rigoma	11	19.30
Borabu	39	68.42
Total	57	100.00

Source: Factory annual reports,1999.

Therefore, we may conclude that about 32 per cent of the green leaf processed at the factory comes from outside the division given that 32 per cent of the buying centres are from outside Borabu. The total capacity of the factory in terms of employment and green leaf is as follows.

Table 5-6: Capacity of the factory

	Capacity
Green leaf	15,000,000 kgs
Employment	300 persons

Source: Factory annual reports,1999.

The processing of green leaf is done in stages. These stages have been analyzed and the problems and opportunities at each stage identified. One stage in the processing leads to the other.

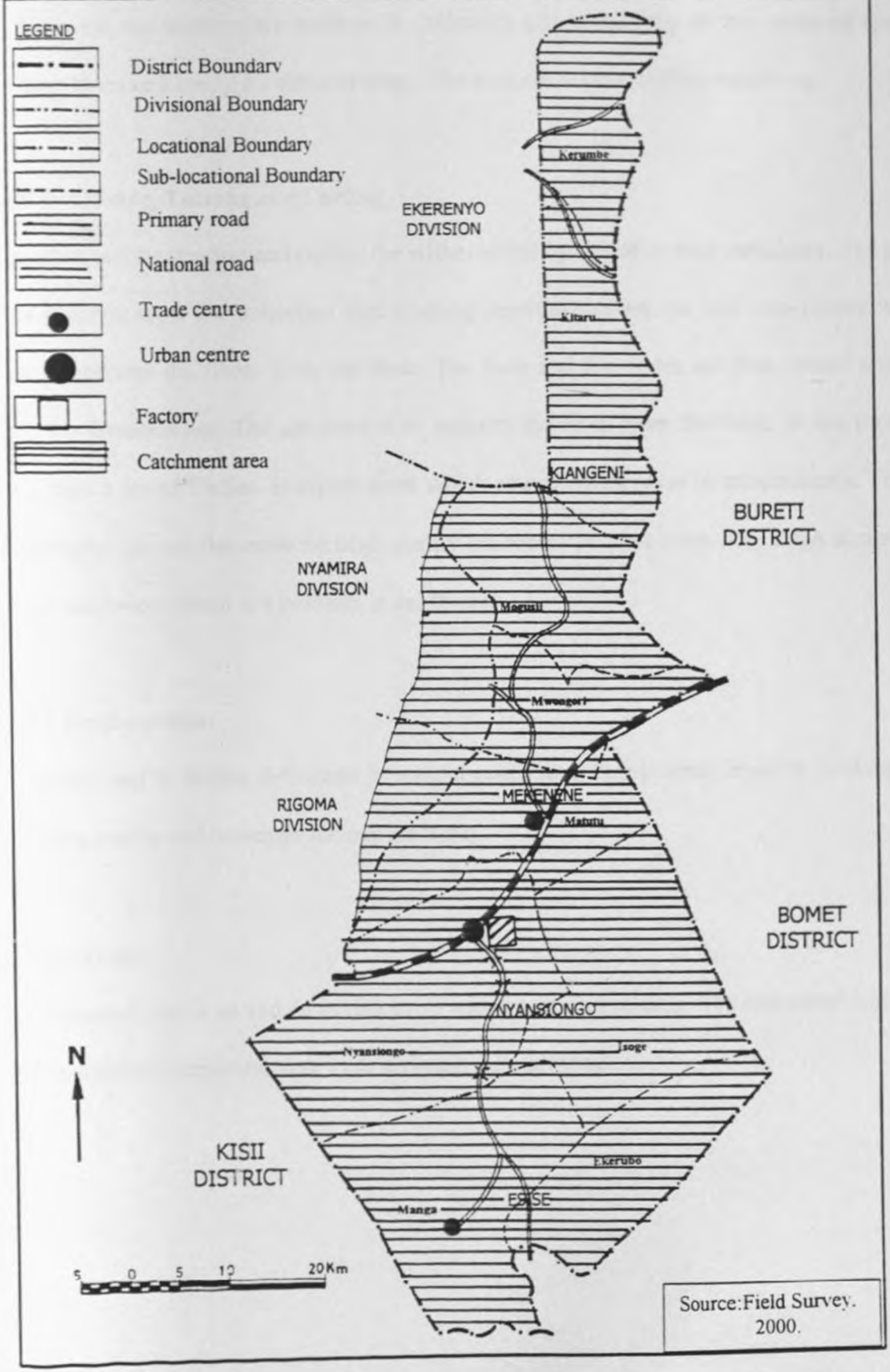
5-1.9.1 Intake

This is the first stage whereby green leaf is received from various buying centres that serve the factory. There is a special open space within the factory where the collected tea is piled together. Factory workers are employed to do this work. The stage is quite labour demanding because the piled tea, if left for long can start fermenting at the wrong stage. Therefore, the workers are required to quickly unload the vehicles and deliver the green leaf to the fanning stage.

5-1.9.2 Fanning

This stage involves withering the collected green leaf by use of fans. The received green leaf is spread evenly on large metal trays. Fans are strategically placed alongside the trays at intervals so as to evenly wither the tea leaves. The fan attendants experience over-working and other occupational hazards like a lot of cold air due to the fans' rotation. The withering process ensures the softening of the green leaf for easier tearing.

Map No. 5-1: Nyansiongo Tea Factory And Its Catchment Area



5-1.9.3 Collection

At this stage, the workers are involved in collecting and assembling of the withered leaf from the trays to make it ready for the next stage. The exercise is quite tedious and tiring.

5-1.9.4 Cutting, Tearing and Curling

It involves cutting, tearing and curling the withered leaf by use of special containers. The process takes place next to the collection site. Cutting involves cutting the leaf into pieces whereas tearing separates the fibres from the flesh. The flesh and the fibres are then curled separately ready for fermentation. The aim here is to separate the fibre from the flesh. In the process of doing this, a lot of friction is experienced which causes an increase in temperatures. The high temperatures are not desirable for high quality tea hence the next stage. The stage also requires skilled manpower which is a problem in the factory.

5-1.9.5 Fermentation

The curled leaf is further fermented in special containers. The process involves cooling which maintains quality and increases flavour gradually.

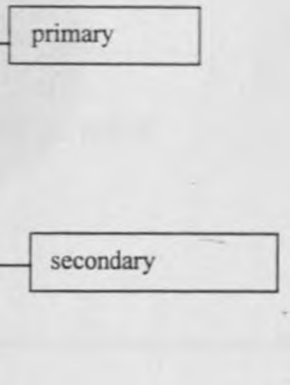
5-1.9.6 Drying

The fermented leaf is spread on drying trays within a given building. The fermented leaf is then dried at constant temperatures so as to maintain the high quality.

5-1.9.7 Sorting

This is the final stage in the processing of tea. It involves sorting out the dried product into different grades ready for consumption. The grades produced in the factory are:

- BP1 (Broken Pekoe)
- PF1 (Pekoe Fannings)
- PD (Pekoe Dust)
- D1 (Dust 1)
- D (Dust)
- F1 (Fannings)
- BMF (Broken Mixed Fibres)

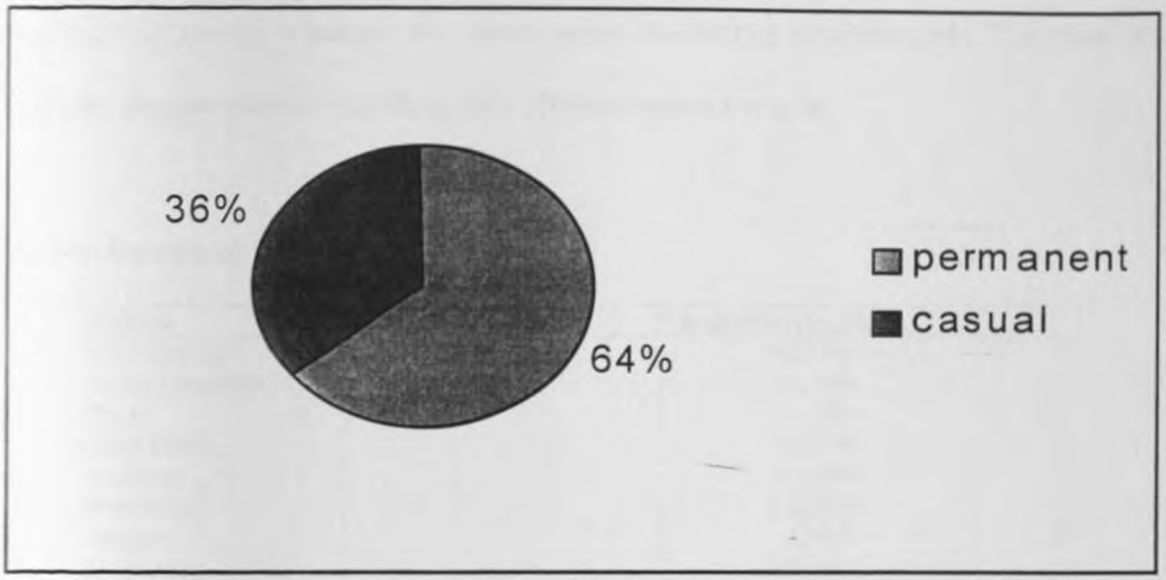


This therefore marks the end of the production column. What follows after this constitutes the distribution column or the forward linkages.

5-2 Forward Linkages

s defined earlier on, forward production linkages constitute further processing towards a finished product or expanding an existing production process so that a broad array of activities are produced as a result of the final product. Tea processing has got weak forward linkages because the final product (Tea) does not allow for further activities or products to be produced. However, some activities arise as a reuslt of the made tea that is produced from the factory. These are packing and marketing of made tea. Before embarking on these, let us first have a look at the employment and income linkages at the factory.

Fig. 5-3: Employment Structure



Source: Field Survey, 2000.

Nyansiongo tea factory employs a total of 237 employees on casual and permanent basis (fig. 5-3). These employees are engaged in various activities connected with the various stages (linkages) of tea processing as discussed earlier on (ref.5-1.9).

Table 5-7: Distribution of the employees

Type of work	Numbers	Percentage
Green leaf collection	53	22.3
Fan attendant	3	1.3
Withered leaf collection	12	5.0
Cutting, tearing, curling	20	8.4
Fermentation	30	12.6
Drying	14	5.9
Sorting	17	7.1
Packing	12	5.0
Compound maintenance	18	7.6
Office	4	1.7
Watchmen	14	5.9
Mechanics	15	6.3
Transport	1	0.4
Management	2	0.8
Supervisors	5	2.1
Sanitary	2	0.8
Factory door sales	2	0.8
Total	237	100.0

Source: Field Survey,2000.

5-2.9 Employment Linkages

During the field survey, a sample was taken across the various positions held. The table below presents the sample selected including their different salaries/wages.

Table 5-8: Sample of factory workers – 2000

Position	Number selected	Salary/wages (shs)
Leaf collector	6	42, 000
Senior Mechanic	2	18, 000
Driver	2	11, 200
Chief Clerk	1	10, 800
Secretary	2	11, 348
Watchman	2	12, 000
Infuser	2	6, 000
Mechanic	3	15, 000
Leaf-coll. clerk	2	15, 200
Secretary 1	2	15, 600
Parkingsupervisor	2	12, 000
Total	**26**	**169, 148.00**

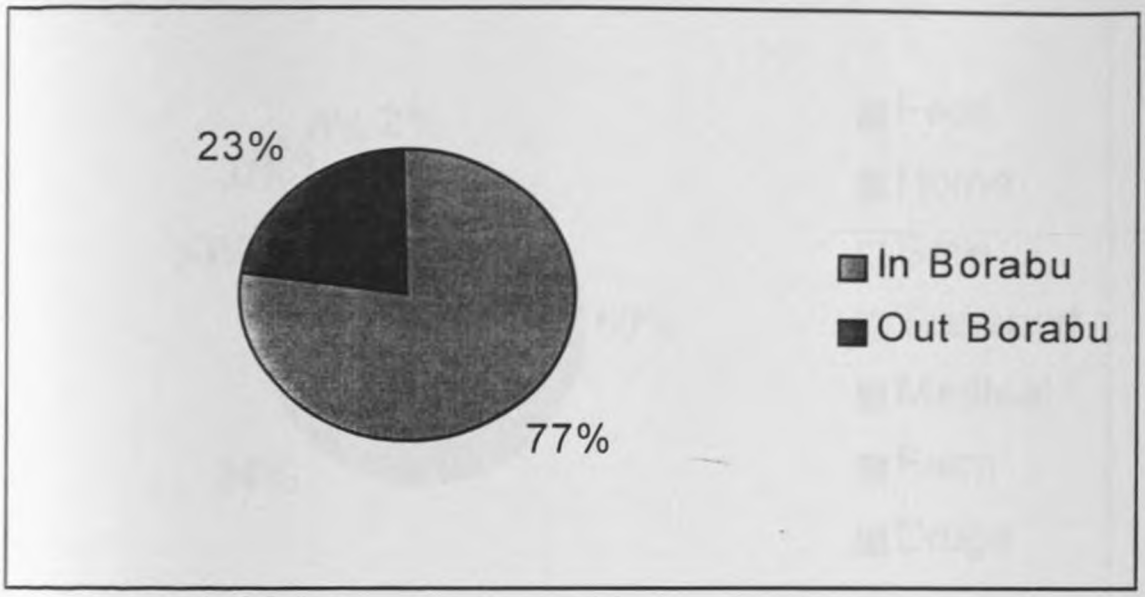
Source: Field survey, 2000

5-2.1 Workers' area of origin

In order to establish the further linkages as a result of the workers' employment, it is important to also establish their areas of origin. Out of this sample some workers were found to come from within the division and others from without .

Therefore, a majority (76.9%) of the factory workers come from the surrounding Borabu Division. This therefore implies strong forward linkages within the tea industry in the division. Further, in order to establish further linkages as a result of this income an analysis was done on the expenditure patterns of the two groups of workers (within / without division).

Fig.5-4: The Workers' Area of Origin

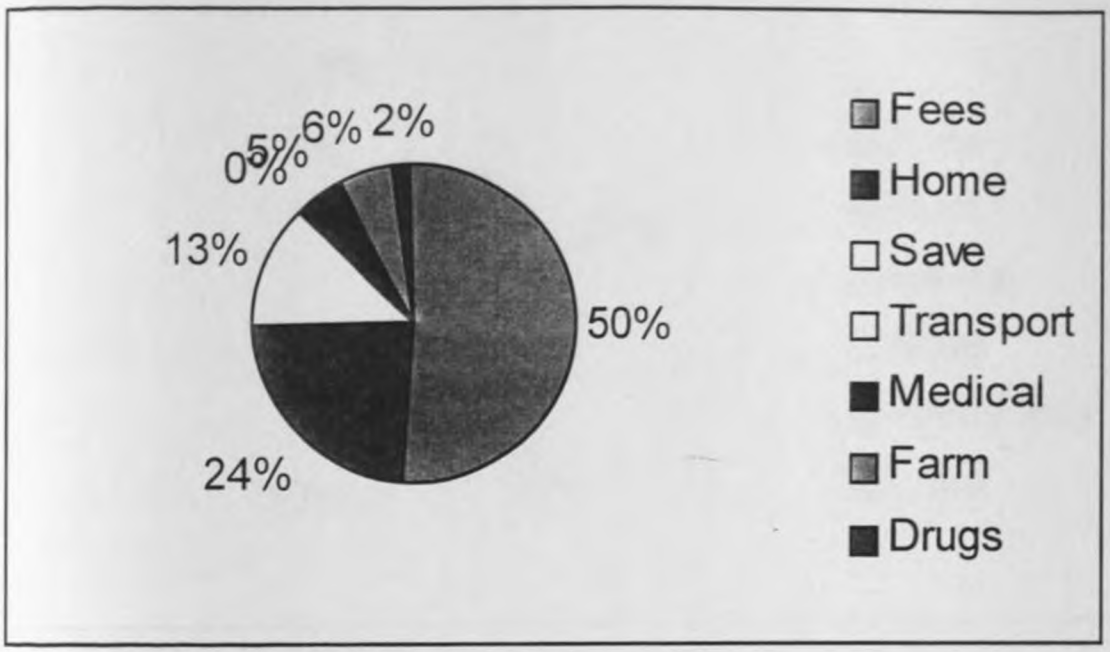


Source: Field Survey,2000.

5-2.2 Within the division workers' expenditure patterns

The 20 factory workers who hail from the division spend spend their income in various ways. These are; home use, farm use, medical, school fees, savings, transport, per month animal drugs. The total amount of money spent and saved is Ksh.110, 838.00. This amount is distributed among the various uses as shown on figure 5-5.

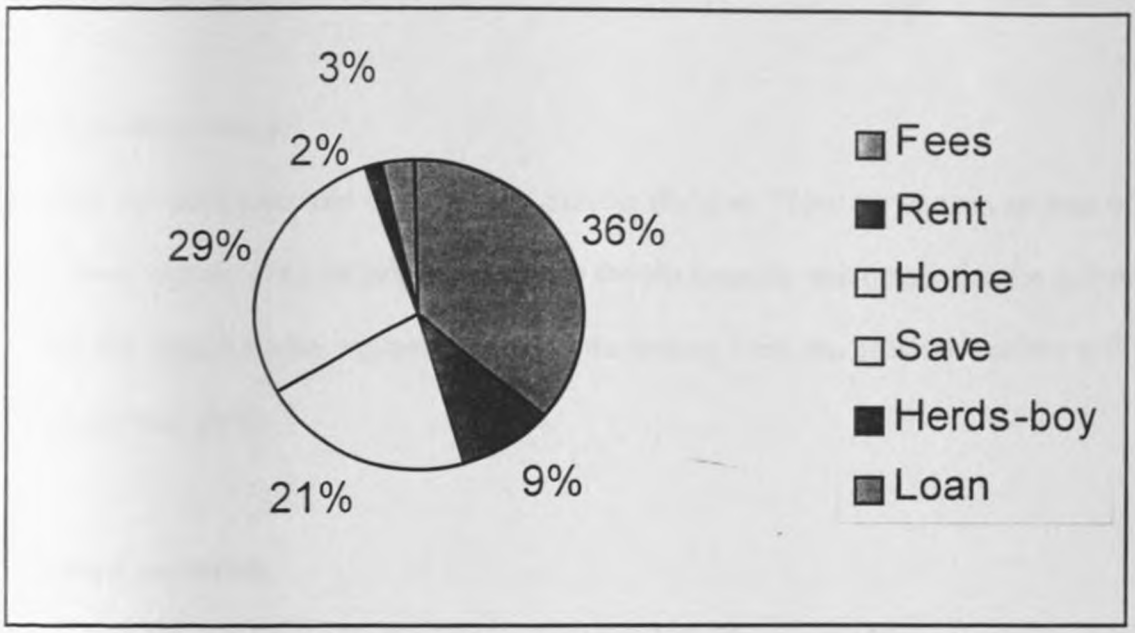
Fig. 5-5:Within the division ways of expenditure



Source: Field Survey, 2000.

We can deduce therefore that the highest expenditure (50.7%) goes to educating children. This shows the importance that the people of Borabu attach to education as a major prerequisite in rural development. On the other hand, the least amount of expenditure goes to transport (0.3%). This is because the workers stay within the factory's proximity and therefore can walk to and from their places of work. These patterns of expenditure also lead to further linkages in the area. The survey revealed that 30 per cent of the workers' savings are invested in improving their housing. Investment in buying of animal drugs ensure a higher reproductive health and hence higher income.

5-2.2.1 Outside the division workers' expenditure patterns



Source: Field survey, 2000.

From the field survey sample, six workers were found to come from areas outside the division. These exhibited different expenditure patterns. (see fig. 5-6). Expenditure on education still ranks highest (36%) for the factory workers who come from without the division. However, these are seen to save more as compared to workers from within the division. This could be due to the fact that the workers from without the division were to maximise on savings so as to send back home. Another aspect of rent comes in and takes a significant percentage (9%). This is because these workers rent houses nearby since they do not hail from the division.

The study found out that out of the total number of workers, 60 per cent of them sent some of the savings back home. Inquiring further on what they spent the money on, the answer was that 30

per cent of them improved their housing while the remaining 70 per cent used the money to purchase land elsewhere.

5-3 Income distribution

Nyansiongo tea factory accrues some income into the division. There are various sources of this income. These include the total payment made to the tea farmers each month for the delivery of green leaf, the annual bonus, payments made to the factory workers. This sub-section will give an analysis of each these.

5-3.1 Initial payments

This constitutes the payments made to the received weight of green leaf from the farmers. (table 5-2)

Table 5-9: Green Leaf Production 1995-1999

Year	Received weight	Price per kg(sh)	Total (ksh)
1995/6	11,202,450.5	6	672 147 00
1996/7	8,935,347	6	536 120 82
1997/8	14,054,574.5	6	84 327 444
1998/9	8,911,387.5	6	53 468 325
	12.949,600	6	77 697 600
Total	**12,949,600**		**336,320, 151**

Source: Factory annual reports,1999.

The low production of green leaf in 1996/7 and 1998/9 years coincides with the low payment. The sharp peak in both production and payment is a response to high rainfall intensity brought about by El Nino in 1997/1998 year.

5-3.2 Final payment

These are the annual payments, which are delivered to tea farmers at the end of every year. They vary from one year to another depending on the green leaf production per year. In order to calculate the total bonus for a given year, the formula is as follows:

(Received weight x price per Kg) – (received weight – factory) weight) x price per kg)

Table 5-10: Final payment (bonus) 1995-1999

Year	R.weight	Factory weight	Difference (FW-RW)	Price/kg (Ksh)	Total (Ksh)
1995/6	11,202,450.5	11,285,622	83,171.5	15.81	175,795,791
1996/7	8,935,347	9,045,129	109, 782	18.00	159,860,175
1997/8	14,054,57405	14,163,602	109,027.5	22.63	315,587,717.7
1998/9	8,911,387.5	8,968,633	57,245.5	17.00	150,523,416.5
1999/00	12,949,600	13,002,602	53,002.0	16.00	206,345,585.0
TOTAL	**560,053,360**	**56 465,588**	**412,228.5**	**89.44**	**908,111,968.2**

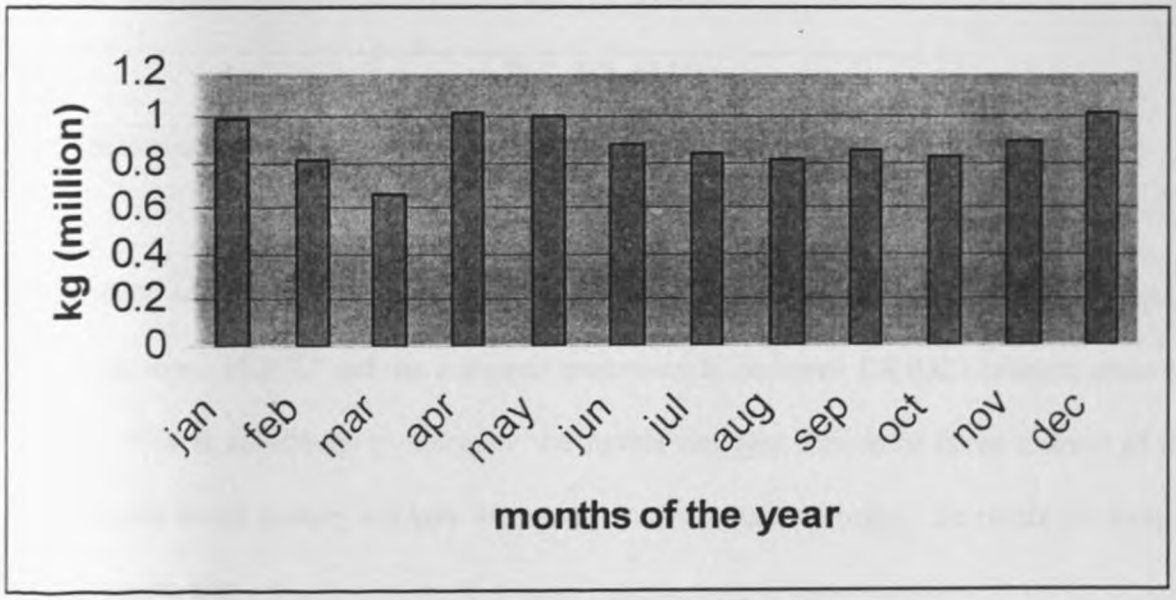
Source: field survey,2000.

The year 1997 still presents the period within which 'Bonus' was highest. This is attributed to the heavy rains brought-about by El Nino.

5-3.3 Workers' payment

The total payment made to workers at the factory account for a big percentage of the total income that accrues from the factory into the region. This sub-section gives a description of multipliers that arise as a result of these payments made to workers.

Fig. 5-7: Workers' payment-1999



Source: Field Survey,2000

The multipliers present the linkages between the factory and Borabu division (see fig.5-2). We can deduce therefore that the highest payments were made in the months of April and may and June. This corresponds to the heavy and long rains during this period which caused the tea crop to do well.

What then is the total income from the factory into the division? This is calculated by adding the initial payment + final payment + workers' payment. Taking a case of 1999/2000, the figures were as follows.

Table 5-11: Factory's total income (Forward linkages)-1999

Source	Amount (Ksh.)
Initial payments	77 697 600.00
Final payment	206, 345, 568.00
Workers' payment	11, 319, 354.00
Total	**295, 362, 522.00**

Source: Factory annual reports,1999.

Taking a case of the factory workers' expenditure patterns, we can compute the marginal propensity to save (M.P.S.) and the marginal propensity to consume (M.P.C.) brought about by the factory. This is an attempt to calculate the further linkages that come up as a result of the payments made to the factory workers. Irrespective of the place of origin, the totals for savings and consumption are:

Marginal Propensity to Consume and Marginal Propensity to Save

	Amount per year	Proportion of the total
Savings	kshs.24,090.00	0.2 (m.p.s)
Consumption	kshs.110,748.00	0.8 (m.p.c)
Total	kshs.134,838.00	1.0

Therefore, having established the marginal propensity to consume and marginal propensity to save, we can then compute the regional multipliers for the total income that accrued from the factory in the year 1999.

5-3.4 Regional multipliers

Regional multiplier is a type of regional analysis which is closely linked to regional cycles. These are cyclical sensitivity of the mix of industrial activities which may be incorporated in a development plan. The analysis emphasizes interactions of sectors within a regional economy and the spread impulses emanating in any one sector to all other sectors either directly or indirectly. Such spread impulses have multiplying effects. Through the continuos back and forward linkages, such spreading impulses leads to a series of effects in each sector including the original one although the effects may not be in the same direction. The regional multipliers present further forward linkages from the factory and therefore additional developmental effects in the division.

From the table below (table 5-12), each additional round of respending of the income inititally generated by investment results in more consumption and therefore further increases income. Each additional income then generates still further increases in consumption and savings as a chain reaction ensues. However, notice that as the process continues, the change in income for subsequent rounds becomes smaller and smaller. As the total cumulative increase approaches 1475 million shillings, the increase in income from subsequent rounds of spending approaches zero.

Table 5-12: Regional multipliers for factory's total income – 1999

Total income 295, 262, 522 = 295, 363 (000)

=295 million

Round of spending	Increase in income (Ksh)	Increase in savings (Ksh)	Cumulative increase (Ksh)
1	0.8 (295) = 236	59	295+236=531
2	0.8(236) = 188.80	47.20	531+188.80=719.80
3	151.04	37.76	870.84
4	120.83	30.21	991.67
5	96.66	24.17	1088.33
6	77.33	19.33	1165.66
7	61.86	15.47	1227.52
8	49.49	12.37	1277.01
9	39.59	9.90	1316.60
10	31.67	7.92	1348.27
11	25.34	6.33	1373.61
12	20.27	5.07	1393.88
13	16.22	4.05	1410.10
14	12.98	3.24	1422.98
15	10.38	2.60	1433.36
16	8.30	2.08	1441.66
17	6.64	1.66	1448.30
18	5.31	1.33	1453.61
19	4.25	1.06	1457.86
20	3.40	0.85	1461.26
21	2.72	0.68	1463.98
22	2.18	0.54	1466.16
23	1.74	0.44	1467.90
24	1.39	0.35	1469.29
25	1.11	0.28	1470.40
26	0.88	0.22	1471.28
27	0.70	0.18	1471.98
28	0.56	0.14	1472.54
29	0.45	0.11	1472.99
30	0.36	0.09	1473.35
31	0.29	0.07	1473.64
32	0.23	0.06	1473.87
33	0.18	0.05	1474.05
34	0.14	0.04	1474.19
	↓ 0		↓ 1475

Source: Field Survey,2000.

To calculate the multiplier, the formula is;

$$\frac{\text{Cumulative increase in income}}{\text{Initial investment}} = \frac{1500}{295} = 5.08 = 5$$

Given that Nyansiongo tea factory at present experiences low productivity by 27.56 percent in ralation to the full capacity of the factory, then it is logical to assume that the regional multipliers would even approach 10 and not just 5 as shown above. However, to calculate the full potential of the multipliers or linkages between the factory and Borabu division, given the percentage of underproductivity, the process is as follows.

Total factory income presently =295 million shillings

Percentage of underproductivity presently = 27.56%

Full potential of the factory in terms of income is

295m=(100-27.56)%

295= 72.44%

x = 100%

therefore: 72.44x = 295 x 100

$$x = \frac{29500}{} = 407.23 \text{ million}$$

72.44 = 407 million shillings.

Taking the formula for calculating the increase in income as;

$$\text{Change in Income} = \text{increase in investment} \cdot \frac{1}{1\text{-MPC}}$$

$$\text{Change in Income} = 407 \times \frac{1}{1-0.8} = \frac{407}{0.2} = 2035 \text{ million}$$

Therefore, the cumulative increase in income given the full capacity of the factory, would be 2035 million shillings. This is much higher compared to the present 1475 million shillings.

5-4 Packing of made tea

This is the first linkage point after the production of the finished product. The inputs here include labour and paper sacks. The factory employs workers who pack the made tea into different grades and weights. The tea is packed in air- tight containers so as to avoid moisture absorption which would interfere with the quality. The paper sacks are obtained from a manufacturer in Kisumu town. As much as the factory is providing market to external regions, there is need to also create market for the internal Borabu region so as to contribute to development fully.

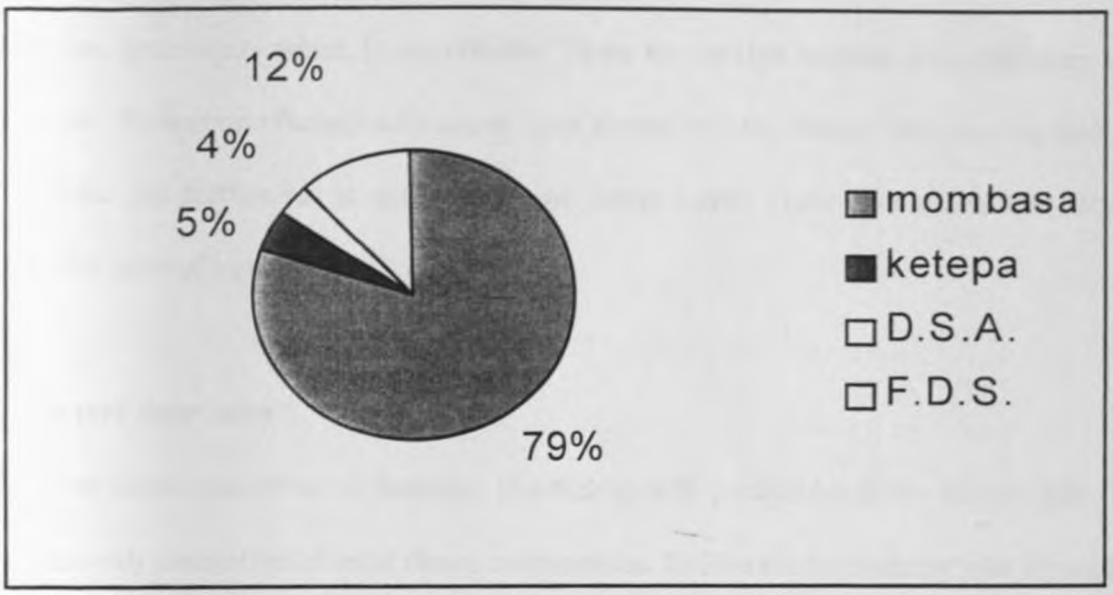
5-5 Marketing of processed tea

This constitutes the forward linkages between the factory and the rural area. Nyansiongo tea factory has got four market outlets; Mombasa, Ketepa, direct sales abroad and factory door sales. Each one of these markets different percentages of made tea as shown in figure 5-8.

5-5.1 The Mombasa auctions

The factory contracts a buyer who sells their tea at Mombasa auctions. Tea is packed onto factory vehicles and then transported to Mombasa on weekly basis. The best quality tea fetches the highest price at the Mombasa auctions. The factory therefore must keep this high quality so as to maintain the buyer. These sales account for the highest sale of tea (80%). However, the major problems experienced are the expenses the factory is likely to forgo when either the sales are low or the market fails.

Fig. 5-8: **Factory Market Outlets**



Key

F.D.S=Factory door sales

D.S.A=Direct sales abroad

Source: Factory Annual Reports, 1999.

5-5.2 Ketepa

Ketepa buys tea locally. However, it sometimes competes with the international market. Nyansiongo tea factory sells 4.5 per cent of their processed tea to Ketepa. (Factory sales department, 2000). The factory vehicles transport the tea to Kericho. Despite the fact that there is an assurance of this market, the percentage is relatively low compared to the percentage sold to Mombasa and hence needs some improvements. With liberalization, tea is today sold to registered individuals through the head office. These individuals are allowed to go through the 45 factories to select the factory to buy from.

5-5.3 International direct sales

This is a rare opportunity which is not reliable. There are foreign tourists who offer very good prices for tea. Nyansiongo factory sells tea to these foreign buyers. Hence, they buy the local tea, take it abroad and further sell it under their own brand name. These presents further forward linkages. The issue of unreliability is a problem.

5-5.3 Factory door sales

These are the direct sales of tea to farmers. The factory sells packed tea at the factory gate. This provides the only percentage of local direct consumption. Before the tea industry was liberalized, only tea farmers were able to buy the processed tea from the factory and the price of this tea was subsidized by the factory. However, today the situation is different. The market is open to any buyer and this has affected the prices of tea, they have gone up from kshs.60.00 to kshs.100.00 per 500-grammes packet.

5-6 Other Linkages

Apart from the backward and forward linkages, there are other linkages associated with the tea industry for instance those that have got to do with public service. Besides employment and income, the factory benefits the rural areas in terms of other developmental services such as roads, water supply, power supply among others.

5-6.1 Water supply

The factory installed a water pump at the nearby Kijauri dam. (see plate 5-2). In so doing, the surrounding population has benefitted in several ways. First, 21 households are supplied with

piped water while others are able to use the dam water. These, according to the field survey, consume 180 litres of water per household per day. Given that the average household size in Borabu is 6, then the consumption rate per person is 30 litres. Given the standard consumption rate for rural areas as 50 litres, then there is a shortfall of 20 litres. Therefore, there are weak but very significant linkages at this level. Weak linkages in the sense that the factory has been able to prpvide water to the surrounding population though not adequately given that there is a shortfall . In addition, the size of the population (21 households) served with water is a very minor percentage of the whole population. Therefore, the factory has contributed to conserving the dam and thereby enabling the people around to benefit from the fresh water to its employees such as the managers. As a result, the surrounding population benefits from this (see plate 5-1).

Plate 5-2: Water pump serving the factory (note the dam at the background)

Source: Field Survey,2000.

5-6.2 Roads

The factory plays a significant role in improving the road condition and network both within its catchment area and outside to areas such as Metamaywa and Keroka. The national tea roads programme provides that out of every kilogram of made tea, 0.48 cents go to the tea cess. This tea cess is then given to the ministry of public works who then spend it in improving the condition of of roads in the division (catchment area) as well as their network.

For Borabu division, out of every kilogram of green leaf, one per cent of the tea income goes into the tea roads repair account. From the field survey, the factory contributes to road repair and has managed to achieve 5 to 6 metres of road repair each year. So far, the roads that have been repaired through gravelling are: Nyansiongo – Manga road; Manga – Raitigo road; Motagara – Nyagachi road; Motamaywa – Ichuni road. (see map 5-2) . In spite of this significant contribution, some roads are still in poor condition. The roads become impassable during the rainy season. This affects the collection of green tea leaf from the buying centres causing delay in delivery of the leaf to the factory. This further affects the quality of processed tea and hence the returns too. Given that the factory operates below capacity, the aim of improving these road conditions may be fulfilled under the new management.

5-6.3 Development of Nyansiongo township as a market centre

Due to the location of the factory at Nyansiongo, other aspects such as population increase and therefore services to serve both this population as well as the processing plant became inevitable. As a result, the centre was designated as a town council in 1996. Coupled with the benefits to the population, the factory has influenced the area (Kijauri) into a market centre. These are further

linkages due to the location of the factory in the area. The surrounding population is able to obtain some income through the various businesses carried out in the town. From the field survey, it was established that different types of businesses are conducted round the factory.

Table 5-13: Types of businesses in Nyansiongo

Type	Number	Percentage (%)
Retail	8	50
Hawking	5	31.25
Tailoring	1	6.25
Welding	1	6.25
Garage	1	6.25
Total	**16**	**100.0**

Source: Field survey, 2000

Formal businesses such as retailing take the highest score (50%) while the various informal businesses take the remaining 50 per cent. The business community gave various reasons for locating their businesses in Nyansiongo.

Table 5-14: Reasons for location of businesses

Reason	Frequency	Percentage
Near a main road	8	32
Ready market	10	40
Available power at factory	2	8
Home	1	4
Growth potentiality	1	4
Near factory	3	12
Total	**25**	**100.0**

Source: Field survey, 2000

Therefore, the available ready market scores the highest frequency followed by nearness to a major transport corridor, the Kisii – Sotik road. Some businesses such as posho-milling and welding locate where they are due to the availability of power from the factory, power being their major input.

The issue of the available ready market is a result of a multiplicity of factors, the main factor being the ready market provided by the factory. For instance residental homes are constructed mainly because of the factory workers who especially come from areas outside the division. The informal selling of fruits and vegetables targets the factory workers who stay around. The informal selling of second-hand clothes (ref. Plate 3-1) also target the factory workers. Small scale garages target the factory vehicles besides the public vehicles.

In a bid to establish the source of the initial capital to start the businesses, the respondents gave a variety of reasons.

Table 5-15: Source of capital

Source	Percentage (%)
Formal employment	5.9
Tea	47
Family contribution	5.9
Maize	11.8
Loan	17.6
Horticulture	5.9
Farming contracts	5.9
Total	**100.0**

Source: Field survey,2000.

The tea bonus seems to be the major contributor to start a business. This constitutes further forward linkages between the industry and the division. When asked whether they operate other business activities elsewhere, a majority answered no.

Table 5-16: Business activities elsewhere

Response	Place	Frequency	Percentage
Yes	Kijauri	2	12.5
Yes	Omoyo	1	6.25
Yes	Nairobi	1	6.25
No	--	12	75.00
Total		**16**	**100.00**

Source: Field survey, 2000

The yes responses of operating other businesses elsewhere cannot be down-played. These present the intra and inter regional linkages which are necessary for the development of regions given that regional development is externally induced. Examining the total annual income accruing from the various businesses, the results were as shown.

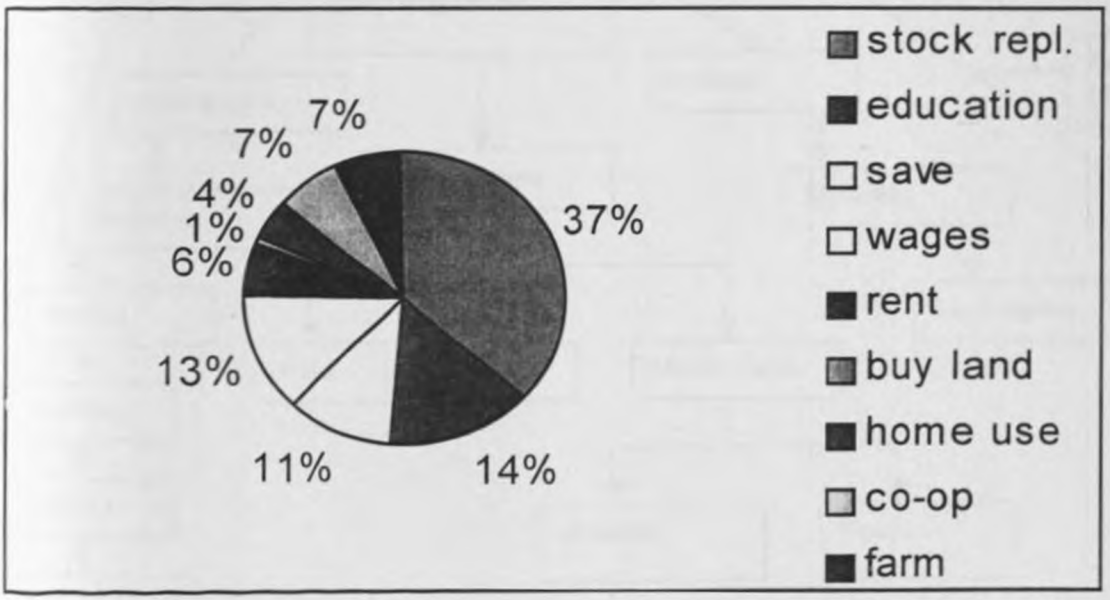
Table 5-17: Annual income from businesses

Income (Sh.)	Frequency	Type of business
8,000	1	Informal
12,000	1	Informal
16,000	1	Garage
40,000	2	Retail
72,000	2	Welding, tailoring
90,000	1	Informal
120,000	4	Retail, informal
24,000	1	Retail
130,000	1	Retail
720,000	1	Retail
1,115,000	1	Retail (hardware)
2,347,500	16	

Mean Income per annum = kshs. 146,718.75
Mode Income per annum =kshs. 120,000.00
Source: Field Survey,2000

Therefore, from these results, we may deduce that the type of business does not necessarily determine the annual income. However, the general scenario is that informal businesses bring in less income compared to the formal retailing business. The mean annual income is Ksh. 146,718.75. However there exists a range of Ksh. 1,107,000.00 between the lowest income and the highest. This presents a problem on how to bridge this gap. Expenditure patterns of the people (businessmen) would present further forward linkages. The field survey established that these people spend their income in several ways.

Fig. 5-9: Expenditure patterns of the business people



Source: Field Survey,2000.

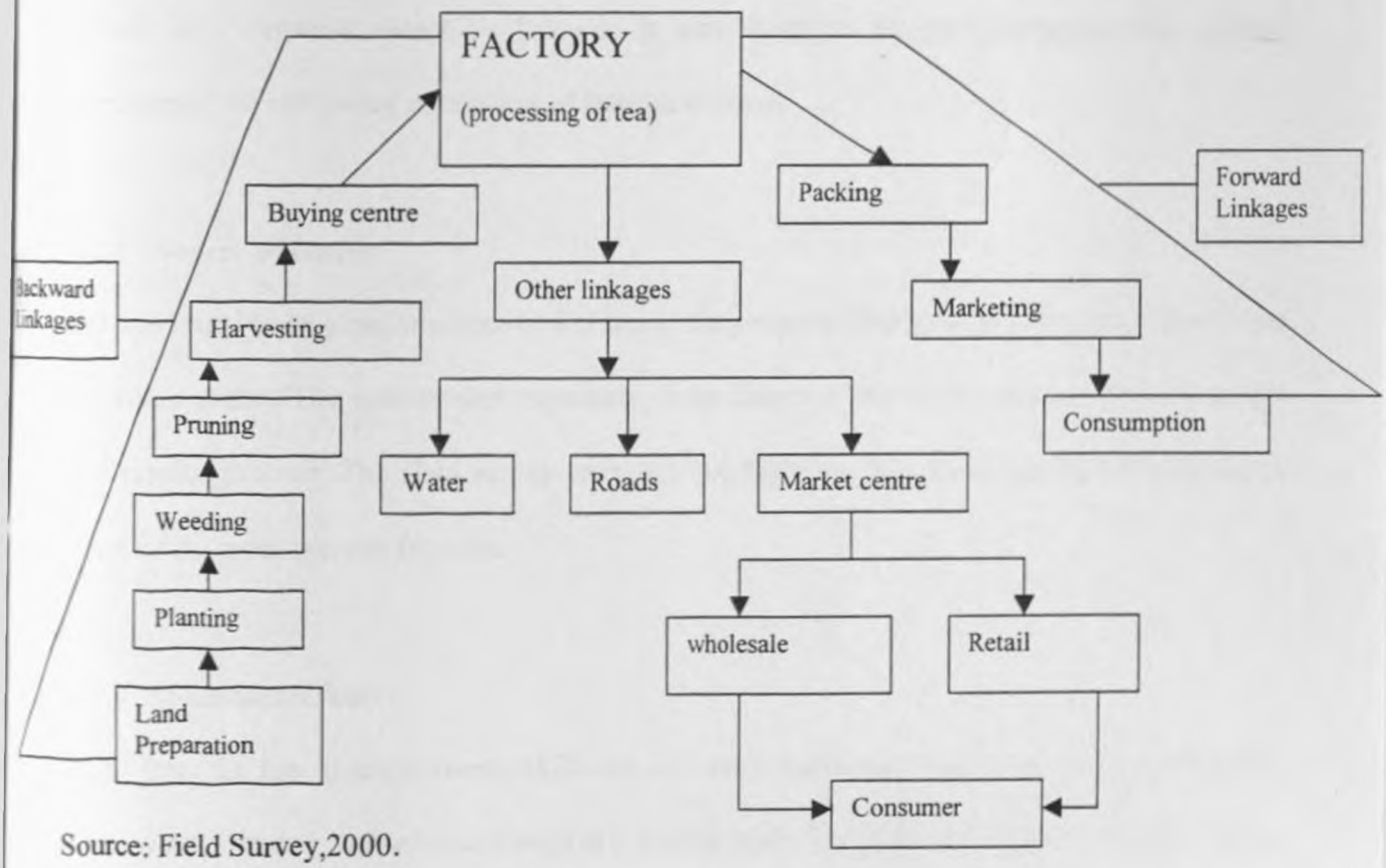
Therefore, the highest expenditure (37%) goes to replenishing the stocks followed by expenditure on education (14%). These present the major linkages between the industry and the business community. Replenishing the stock means that the businesses are run on a sustainable

basis, hence development. On the other hand, expenditure on education ensures a literate people who can be gainfully employed for the sake of development.

5-7 Summary of The Backward and Forward Linkages

The factory induces development in the area in terms of backward and forward linkages as well as other linkages associated with the industry. The following diagram gives a summary of these linkages.

Fig. 5-10: Backward and Forward linkages



Source: Field Survey,2000.

Several problems and opportunities were identified and analyzed along these linkage columns and points. These have been discussed under three main columns; production column,

distribution column, other linkages. It is the aim of this study to critically evaluate these problems, look at the existing opportunities and therefore suggest possible policy measures which are hoped to strengthen the linkages so as to improve the role of the industry in the development of the division. In a nut-shell, we may summarize therefore the main lessons learnt from this analysis of backward and forward linkages as follows.

5-7.1 Source of employment

Tea is labour intensive right from land preparation to harvesting. This aspect though it may be viewed as a negative aspect by farmers, it was found to be an opportunity for creating employment for the young population of Borabu division.

5-7.2 Source of income

Tea was found to be a major source of income to the people of Borabu though most of them were not aware of this. This was evident especially in the source of the capital used to start a business at Nyansiongo town. The field survey revealed that there are still some unutilized potential in terms of the gross income from tea.

5-7.3 Inadequate skills

Apart from the labour requirement, skills are also very necessary in the process of growing tea. These were found to be available though at a limited scale. For instance prunners were quite rare. Therefore, this forced farmers to carry out the practice themselves. Due to inadequacy in skills, the harvested crop was less and of poor quality and hence led to poor returns.

5-7.4 Buying centre activities

The buying centre as a place where the farmers sell their tea formed a major point in the linkage pattern. First of all, the location of the centre was an issue in that 20 per cent of the households interviewed complained of the long distance to the centre. In addition, the mode of transporting the tea to the buying centre was by head-loading. On arrival at the buying centre, the tea is inspected by the leaf clerk located at the centre. If the farmer or whoever delivers the tea leaves did not ensure the fine plucking, he or she is made to select the leaf . This was found to be time consuming and discouraging to farmers. Therefore emphasis should be laid on fine plucking right from the farm.

5-7.5 Multiplier Effects

Multiplier effects as a result of the benefits from tea contributed to further development of the division. This was evident in the farm and factory workers' patterns of expenditure.

5-7.6 Infrastructure

The tea roads programme experiences some bottlenecks. For instance some sections of the roads become impassable during heavy rains. The water supply supported by the factory is limited to a few households. Even for these households, there is a shortfall. In order to improve the living standards of the people, there is need to improve these facilities.

5-7.7 Marketing of tea

Ketepa and the factory door sales which are some of the major factory market outlets absorb small percentages of manufactured tea. It was found out that these two constitute the internal

market. Therefore they should be improved so as to reestablish even the internal market also for development's sake.

5-7.8 Businesses in Nyansiongo

The businesses in Nyansiongo were of two types; formal and informal. Formal businesses were found to remit higher income than the informal ones. The informal businesses which arose as a result of the location of the factory, should however be encouraged to perform better.

CHAPTER SIX

EMERGING ISSUES AND RECOMMENDATIONS

6-0 Introduction

The study set out to examine the role of agro-based industries in rural, development, a case of the tea industry in Borabu division. A summary of the main findings from each chapter has been given at the end of each of the preceding chapters. This section proceeds to evaluate the emerging issues and policy implications and therefore suggest possible recommendations that are hoped to change the current situation for the better. The main issues have been discussed under various sub-topics. Problems experienced have also been discussed under these same sub-topics. The discussion is done in the light of the existing policy.

6-1 Evaluation of the Possible Development of the Area With Regards To Tea Development

6-1.1 Development Potential of the Division

Borabu division is predominantly agricultural with the average farm holding being about 12 hectares per household. However, given the existing rich agricultural resource potential, the division has a high population growth rate (2.16% p.a) owing both to natural increase and immigration factors. Hence, the future situation in terms of the land parcels and population is likely to be unmanageable if no intervention is made. Therefore, there is need to plan for the

family sizes now and also reorganize the present land uses so as to reap maximum returns. This could be done through making use of the large open spaces, which have not been put to use.

Tea is grown in the high potential areas of the country. This aspect makes it compete with other high value cash crops such as maize and pyrethrum, which thrive in the same climatic conditions. Additionally, these areas register high population densities due to their rich agricultural base. Therefore this population exerts pressure on land. The average farm-holdings in Borabu is 12 hectares (field survey,2000). This is relatively bigger than in the neighbouring divisions of the district such as Rigoma Nyamira and Ekerenyo. However, the farmer must decide on which crop to grow or which livestock to keep. The decision by the farmer is determined by the returns he expects to receive from a particular crop in relation to the other alternatives. Thus the farmer will plant the crop that ensures the highest returns within the shortest time possible.

Therefore, tea has relative disadvantages compared to maize or pyrethrum. Tea takes three years to mature, the initial capital and labour investments are also high. However, tea being a high value cash crop, the returns per hectare are higher and the payment system is more regular (per month) and assured. Due to the stiff competition, there is need to search for ways of increasing the producer prices which may lure the farmers to keep on planting the crop. It is hoped that with privatization of the industry, the industry will increase the producer prices since the farmers will be the sole managers of the factory.

6-1.2 The Role of the Factory In The Development of The Division

Rural Development

Rural development is all about improving the standard of living of people residing in rural areas in Kenya. This can be achieved through increase in income and creation of more employment opportunities among other aspects. These two aspects induce other multiplier effects in relevant areas. The rich agricultural resources of rural areas are seen as a basis for development of rural areas. However, this potential has not been fully utilized in Kenya so as to fully develop the rural areas. This has caused many rural areas in Kenya as well as in other developing countries to lag behind urban areas in terms of development. It is important that these areas are developed because a large proportion (90%) of the Kenyan population resides in these areas.

In order to bridge the gap between rural and urban areas, agro-based industries are seen as a major stepping stones unto this endeavour. Given that these industries rely on agriculture for their survival, then they are quite appropriate in utilizing the resource and in return contribute to raising the standard of living of the rural people through increased incomes, employment opportunities, widespread improvements in health, nutrition, housing, improved opportunities for all individuals to realize their full potential. In so doing, it is hoped that an increasing share of the total national resources will be directed towards the rural areas.

In a bid to establish how these agro-based industries contribute to rural development, a detailed examination was made of the industrial linkages within the tea industry in Borabu division and how they have impacted on the development of the division (hinterland). Given that tea is the

main high value cash crop in the area, it is important that its role in the development of the division was examined through the linkage pattern. The assumption that the factory plays a limited role in the division's development remains true.

The policy of industrial dispersal in Kenya was adopted so as to ensure that the benefits of industrial growth are distributed equally thruoghout the country. The study reveals that in order to uplift the role of the industry in development, tea production at the farm level needs to be improved so as to enable the factory process more, thus ensure higher income, more employment and inducement of other multiplier effects in the area.

The Factory

Borabu division alone does not serve the factory, the catchment extends to other divisions of the district. Still with this addition, the capacity is not maximized. Given that the division is a resettlement scheme area, the expectations were that something is wrong somewhere. The situation can be explained by the small percentage of land under the crop, poor husbandry practices. This therefore means that there is potential of the division to produce more tea and therefore earn more income, a potential which is yet to be exploited fully. The ball rolls back to the farmers, to increase their acreage of tea so as to utilize the factory's capacity fully.

The main problem here is the intensive labour demanded as well as the skills needed to carry out work at the factory. Any mistake made in the processing will affect the quality of the final product, hence the final returns from tea. Therefore the factory may need to install appropriate

technology which will make use of the personnel, maintain the quality and also ensure quick processing.

Regional Multipliers

Since the factory operates below capacity, the regional multiplier calculated was 5, which is therefore limited. The full potential, of the factory in terms of the income is kshs.407 million given the 25 per cent under-operation. However the cumulative increase in income is kshs. 2085 million far much higher than the present kshs.1475 million. The cause for this still goes back to the green leaf production, which is low at the farm level. Therefore, in order to maximise, the regional multiplier and therefore development, the production of green leaf by farmers must be improved.

6-1.3 Linkages Within the Tea Industry in Borabu

These linkages constitute both the backward and forward linkages. The nature or strength of the linkages determine their impact on the development of the division.

6-1.3.1 Backward linkages

Tea production

Production at the farm level forms the most important input in the tea industry because of its labour inputs and the impact of the quality of tea produced and therefore the incomes. The scale of production in the division is smallholder whereby each farmer cultivates an average of 1.8 acres of tea. This is far much higher than the countrywide average of 0.38 hectares (0.9 acres).

Contrary to this, Borabu division experiences a 92 per cent deficit in green leaf production. Therefore, this leaves a big question to be answered.

In terms of actual production on the farm, labour inputs, fertilizer application and good plucking methods are crucial for high yields and high quality tea. The application of fertilizer in the division is not satisfactory because of the high prices of fertilizer and of poor quality.

Labour as a major input in tea production is also a problem in the division given that 60 per cent of the households do not have adequate labour supply. This problem affects tea development right from planting to harvesting of the crop. All these aspects impact on the total production of tea in terms of green leaf. Thus the less the green leaf produced, the less the income and therefore employment.

Given the existing scenario, tea production at the farms seems to be the engine that propels other activities in the tea production process in Borabu. Therefore, at this level, the problems of labour, fertilizer, skills and other inputs must be tackled so as to ensure higher production, higher income, more employment opportunities. All these will contribute to the government's current policy to eradicate poverty.

Crop production trends

Tea, a high value cash crop in Borabu, has maintained a high average yield per hectare as compared to other crops such as maize. Despite the fact that maize occupies the highest

percentage of land (57%) in the division, tea still ranks highest in terms of production. Given the current population growth rate and rate of land sub-division, tea is the most viable crop in terms of income. Over time there is going to be pressure exerted on this precious commodity, land due to the population increase. Therefore, it needs to be planned for effectively.

Labour availability

The issue of labour was a major constraint to tea production in the division. 60 per cent of the farmers experience inadequacy in labour. Even for the remaining 40 per cent complained of the labour being very expensive. The was caused by the nature of the household composition whereby a majority of the siblings are in the school-going age. The people of the area value education so much that they do not want to employ their children to provide labour on the farm lest they interfere with the learning process. However, however much they tried to avoid that kind of interference, there have been cases of chid labour in the course of tea production. Although at the moment the problem is not so severe, the practice should be stopped gradually before it goes out of hand. Despite the fact that family labour is used on the farm, this is just but a supplement to the hired or employed labour. Correlations between the household size and labour availability show no significant association confirming further the problem of labour.

Given that the association between tea income and the availability of labour is significant at 39 per cent, then in order to improve the production of tea and therefore the income, there is need to tackle the issue of labour so as to avail it to farmers easily and affordably.

Transportation of Green Leaf From the Farm to the Buying Centre

The main mode of transporting the leaf to the buying centre was by head-loading. This in itself was found to be a problem. The delivery is done mostly by employed workers who naturally would not put in much effort to maintain the crop. This therefore affected the proceeds and hence the final returns. The leaf clerks at the buying centres were another problem. They take advantage of the low literacy levels of these workers and steal some of the leaf by under-recording the weight. This was found to discourage the tea farmers. Therefore, the farmers need to train the workers or employ supervisory workers on the farm. The means of transporting tea from the farm to the buying centre need to be improved. This could be done by use of animal-drawn carts.

Transportation of green tea leaf from the buying centres to the factory

This linkage is not smooth either. The roads are impassable in some sections (ref.map 6-1). This causes delays in the collection and delivery of leaf and hence low returns. Therefore, the affected roads need rehabilitation. Efficient green leaf transportation is one of the government policy objectives on tea production. The transportation of leaf in Borabu both from the farm to the buying centre and from the buying centre to the factory is not efficient. The impediments being poor road conditions in some parts of the division and the lack of transport facilities such as vehicles especialy between farms and buying centres. (ref.map 6-1). This leads to delays in leaf collection and delivery to the factory causing a decrease in leaf quality. The poor roads also lead to heavy and unnecessary expenses on vehicle repair. There is therefore a need to repair the roads so as to meet the government policy on tea transportation and at the same time reduce expenses so as to realize more profits.

Tea Processing

Nyansiongo tea Factory Company limited has a processing capacity of 15 million kilograms of green leaf per year. The mode of manufacture is by cut, tear and curl (C.T.C), which realizes four primary grades and three secondary grades.

Contrary to the processing capacity of the factory, the factory currently operates an average of 11,210,672 kilogrammes of green leaf per year. Additionally, 32 per cent of this is collected from the neighbouring divisions. This leaves a difference of 7,623,257 kilogrammes collected from Borabu, which presents 92 per cent deficit. Therefore, the initial assumption that the farmers of Borabu division would grow tea, which would be serving the factory sufficiently, has not been attained. This leaves a problem, which needs to be tackled because there is an existing factory, which must be used effectively. Given the current scenario, the factory operating below capacity and is likely to be limited in terms of the role it is expected to play in rural development through creation of employment and incomes.

The factory extends its catchment to other divisions of the district. With the existing potential of the division, there is room for producing more tea and hence utilizing the factory's capacity to the full. Tea processing requires intensive and skilled labour. Nyansiongo tea factory is limited in terms of the workers it can employ. This aspect has led to overworking of the present labour force. The factory management should therefore search for ways of improving the efficiency of the present work force so as to raise more income to enable it contribute more to development.

This could be done through training the factory workers or alternatively employ trained or qualified personnel.

Employment and incomes

Raising the incomes of the rural people is one of the objectives of poverty eradication policy in Kenya. Tea is a perennial crop with an economic life of 50 years. The expected green leaf production per month per hectare is 3175 kilograms, hence an income of Kshs.19,050.00 per month per hectare given the current price of six shillings per kilogram. In Borabu, a tea farmer earns kshs.1474.00 per month from one acre. The variation is quite large. Reasons that may explain it include the poor husbandry practices, poor fertilizers, poor roads and the predominant role played by workers in the process of tea production.

The Welfare Monitoring Survey 11(1994) report reveals that the overall poverty line for rural areas in Kenya is kshs.978.00. However, there are two classes of rural areas; the poor and the non-poor. The non-poor areas are characterized by well laid infrastructural networks, modern commercial farming systems among others. Borabu division falls in the category of the non-poor areas. Considering these aspects, the non-poor areas' monthly income in terms of cash crop production was set at kshs.1663.00 Hence for Borabu, the income from tea is slightly less than that set at the national level.

However, the study reveals that there are opportunities, which have not been utilized well in Borabu. There is a big room for improvement as can be seen from the total potential of the area.

However, the root cause of this could be due to the scale of green leaf production at the farms. The continuation of this trend will mean that the areas resource base will continue to be underutilized. Given the population growth rate of 2.16 per cent, then this average income per month is bound to decrease further.

In terms of employment, tea is a significant source of employment not only to the families that grow the crop but also for the employees on the farms and in the factory. Further, the investments of these incomes in trade, commerce and rural infrastructural provision create additional employment and incomes in these sectors and other related sectors. However, the low producer prices as compared to labour inputs in tea were identified as a problem hindering the expansion of tea growing in the division. However, it is expected that with the liberalization of the tea industry and K.T.D.A in particular, the producer prices will go up. It is therefore hoped that this will enable the farmers invest more in terms of development, hence causing further development in the division.

Employment figures for Borabu division were found to be higher than those of the surrounding divisions due to the fact that Borabu falls in the wealthy category of rural areas. Tea farmers in Borabu were found to spend very little time on the tea farms because many of them are out because of employment elsewhere. A good percentage relied on workers to do all the work. This is an aspect, which was found to cause the poor production of green leaf because workers are not keen to practice good crop husbandry practices. If this trend continues, then the situation will be worse. So their participation in tea production should be limited.

6-1.3.2 Forward Linkages

Tea marketting

The factory has got four market outlets each of them marketing different percentages of made tea. These are; factory door sales (FDS), Ketepa Sales (KTP), direct sales abroad (DSA), Mombasa auctions (MBS). Therefore, the farmer directly buys the made tea through the factory door sales, which account for 11.2 per cent. This percentage represents the forward linkages from the factory to the hinterland. Therefore 88.8 per cent of the made tea is sold outside the division, thus Inter-regional linkages.

Regional development is mainly externally induced. Therefore, the existing situation if left to continue, will lead to the development of the region. However, looking at the situation critically, overdependence on the external market is also risky. If for instance the market collapses, it will also mean that the farmers and all those depending on the tea get affected. Therefore, this leaves a question mark on this dependence on the external market. Something needs to be done on the internal market also.

The nature of a product from an industry and its marketing determines the nature and strength of linkages of that industry. With regards to the tea factory, forward marketing linkages are weak due to the final processing that takes place in the factories, which does not allow for advanced manufacture. Therefore, any linkages that exist are related to the packaging and marketing of the processed product.

6-1.3.3 Other Linkages

Water Supply

From the water pump installed by the factory at the Kijauri dam, 21 households near the factory have been able to get water. On average, a member in each of these households consumes 20 litres of water per day. This presents a shortfall of 30 litres being the planning standard set for rural areas in Kenya. Therefore, the provision of water is not adequate and therefore needs to be improved.

Multiplier effects

Multiplier effects arise out of the direct and indirect gains from tea. In the area of study, a factory worker earns his income, takes a proportion of it (3%) and saves. He later invests his savings on business. In this case he opens up a shop where he employs one shopkeeper and pays rent. The money spent on the shopkeeper's salary represents multiplier effects. Further, the shopkeeper may also decide to open a green grocer to earn more income, hence more multipliers.

The multiplier effects are seen to contribute to development through raising the income levels and creating more employment opportunities. The survey revealed that the factory operates below capacity implying that the potentials of the area are not fully utilized. The farm level production is poor. Therefore in order to realize even greater multipliers, there is need to improve farm level production for instance through raising the acreage of tea farms and improve the delivery of tea to the factory. This will minimize costs and ensure more profits hence increased salaries for factory workers and increased incomes for farmers.

The businesses in Nyansiongo were of two types; formal, informal. Formal businesses were found to remit higher income than the informal ones. The informal businesses, which arose as a result of the location of the factory, should however be encouraged to perform better.

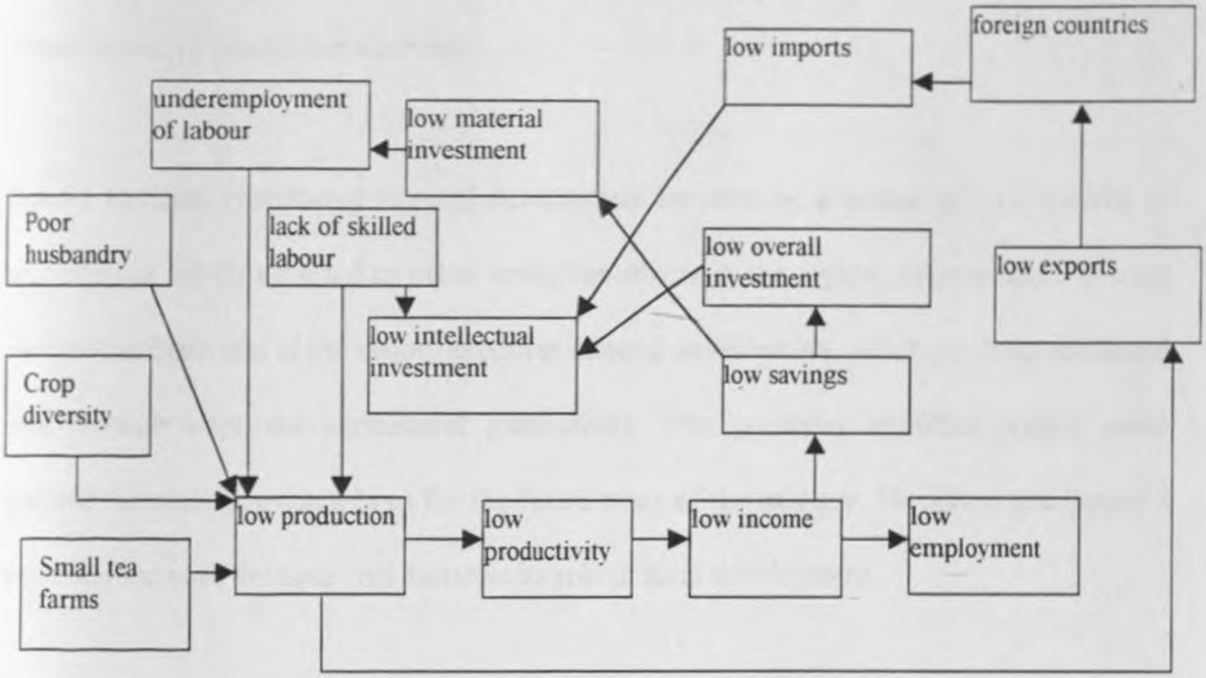
6-1.4 Expenditure Patterns

In order to reveal the multiplier effects from tea, the expenditure patterns of the tea farmers formed a major insight into this. The farmers' highest expenditure goes to educating the children. This could be attributed to the fact that the population is basically young with a majority of people in the school going age. On the other hand, the factory workers also spend the bigger portion of their income on educating children. This implies that in future, the people of the division as well as those who benefit from the factory in terms of education, will be an educated lot who can be gainfully employed in development.

6-2 Summary

In an attempt to link all the emerging issues in this chapter, we realize that the route cause of all the issues discussed could be said to be the low production of the tea at the farm level. This factor leads to low productivity at the processing level. This can be summarized in the following flow diagram.

Diagram 6-1: What does low tea production mean in Borabu?



Source: Field Survey,2000.

Low production at the farm level is caused by inadequate labour and skills, poor fertilizers, poor infrastructure, poor husbandry, crop diversity, small tea farms among others. Due to the low production of tea at the farm level, there is low productivity at the factory level, which leads to low income and employment. Because there is less tea produced at the farm level less is processed and therefore less is exported to foreign countries hence low imports. The low income from the crop implies that there will be less savings and therefore less overall investment both in material and human investment

Irrespective of the established bottlenecks, the foregoing discussion indicates that the factory has played a role in rural development in terms of generating jobs for rural people. This is both at the factory level and at the farm level due to he backward and forward linkages. Employment in

Borabu division has been improved by the establishment of the factory especially because of its very labour intensive production methods.

The factory has also contributed to rural development by creating a source of cash income to farmers, incomes which have led to other multiplier effects in the region. Improvement of rural cash income has been one of the major objectives of rural development, which has been envisaged to come through improved agricultural productivity. The problems identified present weak linkages and therefore provide a basis for the future plans of the industry. Therefore, the factory's backward and forward linkages well illustrate its role in rural development.

6-3 Conceptual Model

From this evaluation of the main findings and therefore policy implications, we may summarize and say that the capacities of Nyansiongo tea factory to effectively contribute to rural development are limited. However, this limitations can be effectively removed through the improvements of the production of green leaf, sufficient supply of labour, maintenance of constant market prices, improvement of the management, efficient and timely delivery of green leaf to the buying centre and to the factory and its efficient distribution to market points, improvements of infrastractural facilities and improvement in the utilization of income generated by farmers, workers and the factory.

Basing on this conceptual model, various policy goals may be derived which could direct the planning of agro-based industries in rural areas in general and the Nyansiongo tea factory in Borabu division in particular. These are:

1. The improvement of the production of green leaf as a raw material for the tea factory.
2. The efficient and timely delivery of green leaf to the buying centres and to the factory and finally to marketing points.
3. Ensure the supply of sufficient labour.
4. Improvement in, marketing.
5. Improvement of infrastructure facilities.
6. Improvement in management.
7. Improvement in the utilization of income.

To address each of the four policy goals, various objectives have been identified from the study. These are:

Improve the production of green leaf:

- To encourage more farmers to plant tea.
- To encourage the current tea farmers to plant more tea and therefore increase the acreage.
- To maintain the standard plant density.
- To improve the tea husbandry practices.

- Improvement in the utilization of income.

Efficient and timely delivery of green leaf to buying centres and to factory

- Reduce the walking distance to some of the buying centres.
- Improve efficiency of collection of tea leaves from buying centres .
- Improve efficiency of transportation of made tea from the factory to the marketting points.
- Encourage formation of co-operatives
- Improve company transport
- Encourage public or private transport

Ensure the supply of sufficient labour.

- To increase the number of farm workers.
- To increase the number of factory workers.

Improve marketting

- To encourage both inter and intra-regional linkages.
- To improve the factory workers efficiency/performance.
- To improve/increase the farmers' efficiency.
- Development of efficient network of wholesale and retail facilities in the division.

Improve infrastructural facilities

- To improve the rural access roads conditions to all weather standard.
- To improve and extend the tea roads
- To improve / extend the water supply.

Improve management

- Improve farm management
- Improve management at the buying centres
- Improve the management at the factory level

6-4 Policy Recommendations

The discussion in section 6-2 offers some highlights on the problems and issues identified along the various linkage columns and points of the tea industry in Borabu. This section proceeds to give recommendations basing on the priorities of the local people and a realistic assessment of the implementing capacity. The recommendations are derived directly from the policy goals and objectives and are grouped into three depending on the period within which they will be implemented; short-term (up to 2005), Medium-term (up to 2010), long-term (up to 2015).

6.4.1 Short term recommendations

Improvement of the production of green leaf

Green leaf production at the farm level was found to be one of the major problems or constraints facing the tea industry in Borabu. In order to address this, this study recommends that tea farmers

maintain the K.T.D.A. standard plant population of 7135 plants per hectare. It was established that tea farmers in Borabu own big acreages of tea which however do not produce equivalent volumes of tea. One of the reasons why this happens was due to the large spaces found in between tea plants which not only choke the tea plants but also compete with the tea crop for nutrients available in the soil. The farmers should be helped to do this by the extension staff which will have been engaged by the factory company to provide such services.

II Considering that the average ratio of the area under tea to the total household land size per household is 1:13 (Field survey, 2000), then tea farmers should be encouraged to increase their acreages of tea so as to ensure a higher production of green leaf. However, they should do this with the issue of food security in mind such that they do not become cash-crop growers at the expense of food crops. Therefore, the factory company through the extension staff should supply tea seedlings to willing farmers at an affordable (or subsidized) price.

III In order to realize high returns from tea, it is necessary that crop husbandry practices be maintained. The quality and quantity of tea in particular decreases if these practices are not maintained. A decrease in both quantity and quality implies a decrease in incomes too. Farmers therefore should be adviced and taught by the managing agent, on how to plant, weed, harvest, prune the right way and at the right time. K.T.D.A. Limited should assume the responsibility of training the farmers on this. For instance, pruning should be done in time, fertilizer should be applied on time and in the right quantity, strict plucking should be done ensuring two leaves and a bud for high quality tea production.

IV Some of the farmers (40 per cent) in Borabu rely on farm-workers to provide the labour that is needed in the production of tea. Farm-workers do not take stern care over the methods of production, such that they harvest the tea carelessly and do the pruning carelessly. Even after transporting the leaf to the buying centre, they are unable to tell the total weight. Malpractices of leaf collection clerks in the buying centres have been noted as a problem that afflicts the marketing of green leaf. Therefore, the farmers should limit the involvement of farm-workers because interference of the tea crop at the farm may mean less and less of the green leaf harvested hence less returns. Alternatively, farmers should employ more qualified supervisory staff to supervise the duties carried out by workers.

Tea is a labour-intensive crop. It requires close attention right from the time it is planted to harvesting. Given that the division experiences a problem in labour, then there is a definite problem in the yields from the crop. Any mistake made in any stage in the course of tea development will affect the final proceeds. With the current labour situation, it is suggested that the farmers come together, organise their employed labour into groups so that they take turns to work for each other in their respective farms.

There was a complaint that the fertilizers provided by the K.T.D.A. credit scheme were of poor quality and quite expensive. Therefore, it is recommended that the factory company starts the supply of more quality fertilizer though through a credit scheme and at a subsidized price to farmers. This is envisaged to improve the crop yields. It is also suggested that farmers get

encouraged to set up co-operatives to assist in supplying inputs, marketting or collection of green leaf and manufactured tea and distribute earnings and other credit facilities.

Improve management

Given that the production of green leaf at the farm level will have been improved, the resultant situation will be increased output from the factory and hence higher income. This therefore calls for transparency and accountability on the part of the management as pertains to handling of the cash. This improvement in management is necessary at four levels; the farm whereby farmers will be required to manage their income well, the buying centre whereby the employed supervisory staff should ensure transparency, the factory and marketing levels whereby he management is requested to be keen on the marketing of manufactured tea as well as on the distribution of the income or the proceeds from tea. They will have to keep strict records which will need to be audited internally as well as externally at least once a year. Strict supervision of the processes will also be necessary.

Improve Marketing

I About 90 per cent of the made tea is sold to external markets. As much as regional development is mainly externally induced, there is need to also stabilize the internal market. The internal market should serve as a saviour whenever the external market fails. Therefore the factory company should encourage more farmers to buy manufactured tea from the factory through the current factory door sales though at a subsidized price. Alternatively, the factory should improve its marketing overseas by marketing their tea more aggressively and increasing

the volume marketed externally. This is hoped to improve the external market and lead to the development of the region, Borabu.

6.4.2 Medium-term recommendations

Improve the production of green leaf

It was established from the study that some farmers in Borabu do not grow tea. Having known that tea is a high value cash crop with constant income, coupled with a high population growth rate which will demand more facilities such as education, tea is therefore seen as a major contributor to raising the incomes of the people. Therefore, there is need to encourage non-tea farmers to plant the crop. The Factory Company should hold seasonal seminars with these farmers so as to create awareness among them on the importance of the crop. A positive response will ensure that more area is under tea, more green leaf production and therefore higher returns in terms of income and employment.

Ensure the supply of sufficient labour

i. Sixty per cent of the households (tea-farmers) interviewed confessed that they did not have adequate labour. This inadequacy was seen in the patterns of output whereby the highest number of workers was six. However, the highest output was experienced with four workers. Given that the average number of farm workers per household is three, then the tea farmers should utilize their labour effectively so as to reap maximum returns. This is hoped to improve their returns over time and enable them to employ more farm workers.

ii. With the assumption that the green leaf production will improve through the short-term recommendations, then the factory should consequently increase the number of factory workers especially on permanent employment basis. This is in a bid to increase workers' productivity and also avoid the issue of having to recruit casual labour.

Improve Marketing

i. The study established that the low production of tea right from the farm level is attributed to the malpractice of leaf collection clerks in the buying centres. The clerks were reported to record incorrect weight of green leaf delivered by farmers. The study recommends that supervisory staff should be employed by the factory in order to minimize if not eradicate the incidence of such malpractices. This will encourage farmers to produce even more tea of high quality, which will fetch high market prices.

ii. The productivity of workers is a major aspect in determining the final income or profits of the factory. Presently, on average, a factory worker earns Kshs. 3980.00. Considering that the standards of living have gone up especially in educating children, medical expenses and so on, this level of income is definitely not adequate. The workers themselves complained of low income. It is worthwhile to note that the incomes earned by factory operatives are often repatriated to their families in the division and outside the division. Though inadequate, the salaries are significant in raising the standard of living in the region and supplementing the farm incomes.

Therefore, to overcome the problem of the limited effect on the regional economy and also improve the workers' productivity and thereby contribute more to the regional economy, the raising of salaries paid to operatives would greatly help in raising the standard of living of the workers and their families and dependants. In order to do this, the factories should use value of output and duties performed as criteria for determining wage levels rather than basing them solely on standards of education attained.

Improve management

I. It is fair that a farmer who produces tea at the farm level is paid his/her dues according to the amount of green leaf he/she delivered to the buying centre. However, the situation in Borabu was found to be different. The clerks at the buying centres were reported to be under-recording the farmers' green leaf, a factor that discouraged farmers a lot. Therefore, it is recommended that the Factory Company employ supervisory staff at the buying centres to watch over these malpractices. This will strengthen the backward linkages of the industry.

II. The Gusii people value land as a form of property. Given the existing population growth rate of 2.16 per cent per year and immigration, the foreseen future problem lies in land sub-division. The problem was even evident in some of the households at the time of research. It is easier and more viable to produce more profits from agriculture by cultivating on large farms than on small farms. Therefore the District Officer is requested to intervene at this level and stop any further land sub-division so as to ensure that the current tea plots are not decreased further but increased so as to ensure higher production. The chief should set a rule to stop any further land sub-division. Instead, one household should have one homestead and the members of the

household should eke their living from the land holding that belongs to this household. This is envisioned to increase the output from the piece of land by making use of the economies of scale.

III. Most land pressure in the division is caused by in-migration of people from neighbouring districts and divisions where land pressure is even higher than Borabu. Therefore to stop further land sub-division as a result of this, it is suggested that the former policy on settlement schemes be maintained. That there should be no more sub-division of land.

Improve infrastructure facilities:

I Tea is a highly sensitive crop after it has been harvested. It requires that it is delivered to the factory for processing within the shortest time possible. The transportation of green leaf to the factories is done by K.T.D.A. vehicles and staff from a leaf-base located at the factory to which the leaf is being transported. A common problem identified in the transportation of green leaf is the poor condition of roads especially during the rainy season first from the farm to the buying centre, second from the buying centre to the factory. The rainy seasons coincide with flush periods (when the harvest is highest) and this is the period when the roads are in poorest condition. Therefore, a vehicle may not be able to collect leaf from all the buying centres, which it is supposed to serve. Thus, wastage of green leaf.

Tea roads are constructed by K.T.D.A. with the assistance of the Ministry of Information Transport and Communications (M.I.T.C). The M.I.T.C however maintains only classified roads. Therefore, this leaves a majority of tea roads unmaintained. Co-ordination between M.I.T.C and

the Factory Company is needed so as to rectify the situation. Rehabilitation of difficult sections of these roads (ref. map 6- 1) which have sometimes been done by K.T.D.A. should be encouraged and continued in their road programs. The District Development Committee, (DDC) should also set funds for road improvements in the tea zone as this will ease the transportation of tea and improve the overall access and feeder roads and the marketing of other farm produce.

6.4.3 Long-term recommendations

Improve the production of green leaf

Intensification of tea growing has been emphasized both under short and medium-term recommendations. This strategy in presently producing areas will necessitate some infrastructural outlays. However, this will necessitate expansion of existing factory or the construction of new ones (depending on the amount of green leaf delivered) to take up the increased output of green leaf. This arrangement will also save costs of collection of green leaf, as more leaf will be collected from a smaller geographical area. In this way, it will be possible to decrease cess charged on farmers and hence increase their incomes and overall standards of living, hence rural development. This strategy will help in the rural economy and reaching the poorer sections of the rural population. This will assist in bringing the rest of the rural poor into the national economy and will be in line with the aims of the 1999 – 2015 National Poverty Eradication Plan (N.P.E.P.). The N.P.E.P. is a plan laid out in 1999 with the aim of eradicating poverty through several ways, one of them being the increase in rural incomes.

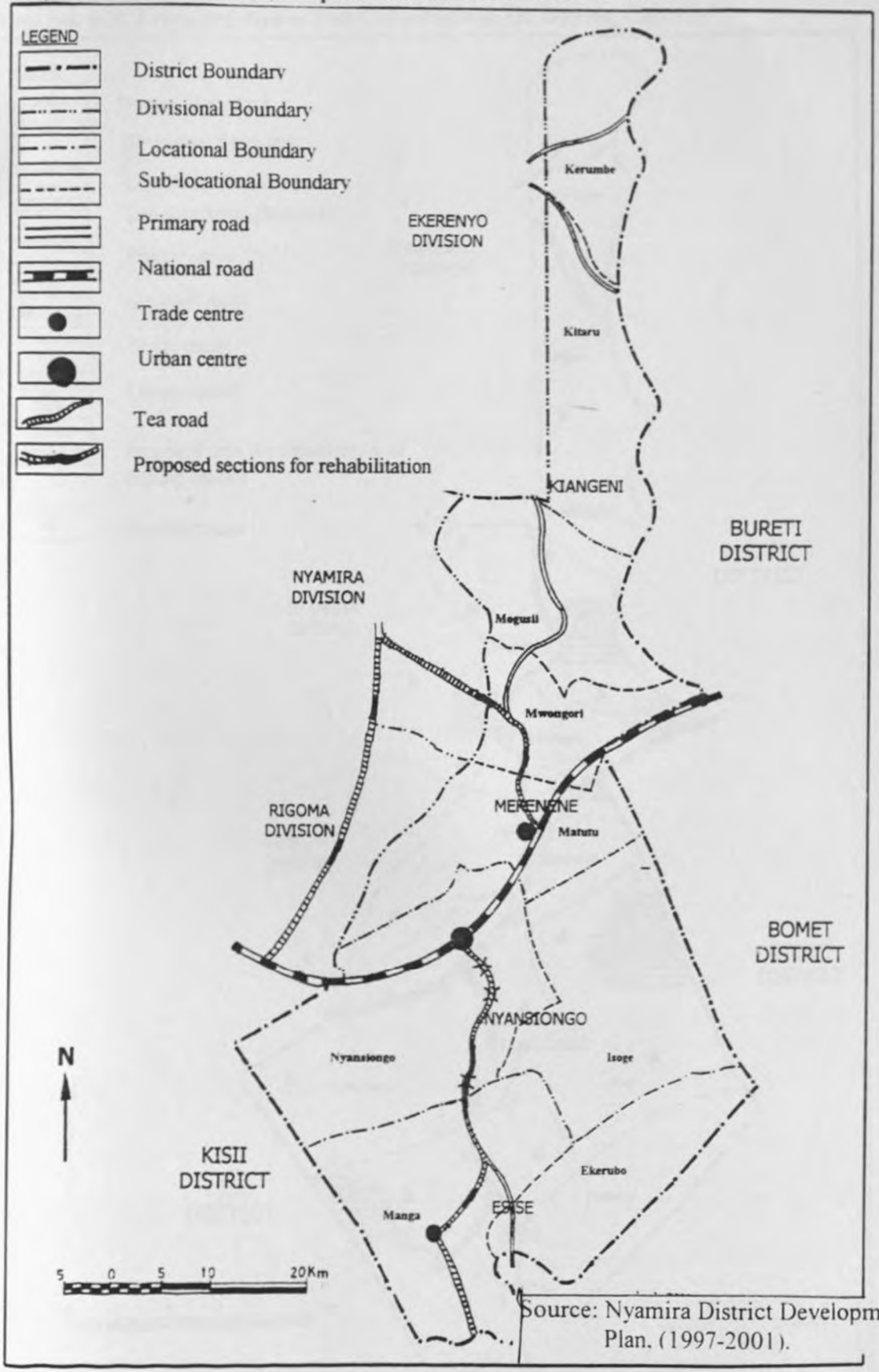
Efficient delivery of tea from the farm to the buying centre

Some of the tea farmers (20%) complained about the long distance they have to cover to the buying centre. Given that tea is a highly sensitive crop, it requires that it takes the shortest time possible between the farm and the factory. In order to limit the time on walking to the buying centre, the factory should set some funds aside for the construction of buying centres in areas of deficit (ref. map 6-1). There can also be improvement if farmers used part of their earnings to buy vehicles for transporting their tea to the buying centre alternatively as a co-operative.

Improve Marketing

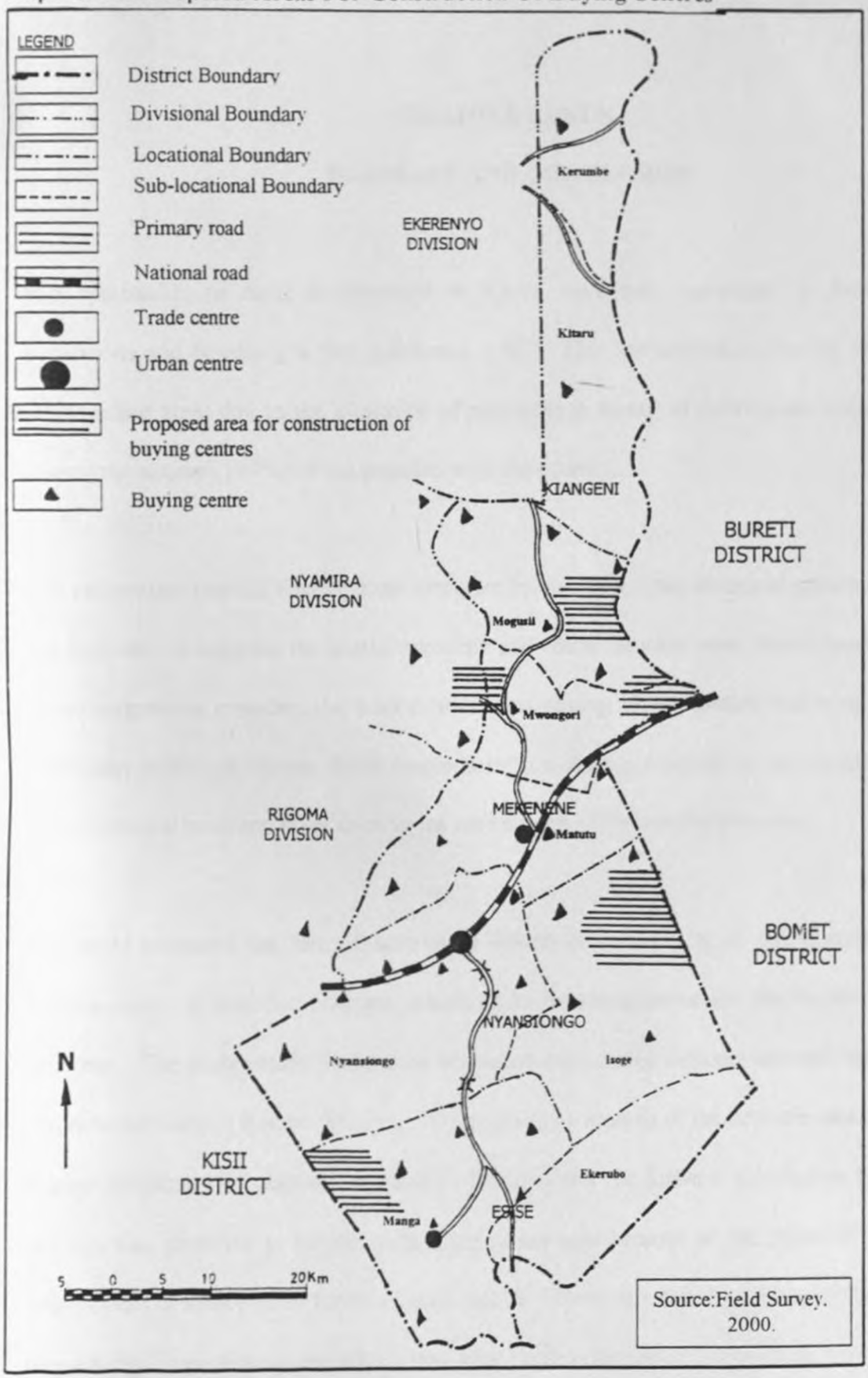
Despite the fact that tea is a labour intensive crop, the level of technology used in the factory is predominantly capital intensive thus minimizing the creation of employment at the factory level. It also implies that a considerable expenditure in foreign exchange in installing the machinery and buying of spare parts. The ministry of industry and commerce should study and come up with ways of decreasing this capital intensity of these factories without adversely affecting the quality of tea produced. This move paves way for an increase in the factory's potential to create more employment. Other ways of using appropriate local machine components should be studied to lead to integrated rural development.

Map No. 6-1: Tea Roads, Proposed sections to be rehabilitated



Source: Nyamira District Development Plan. (1997-2001).

Map No. 6-2: Proposed Areas For Construction Of Buying Centres



CHAPTER SEVEN

SUMMARY AND CONCLUSION

Past approaches to rural development in Kenya have only succeeded in stratifying rural populations and benefiting a few (Michoma, 1980). This has resulted to the lag of rural areas behind urban areas due to the allocation of resources in favour of urban areas while rural areas possess the majority (90%) of the population of the country.

Past and present regional development strategies focusing on urban areas and growth centres have not been able to integrate the spatial economy and reach the rural poor. Rural development in a broad perspective considers the inter-relationships among all the factors that contribute to the well-being of the rural people. Rural development is a strategy adopted by various governments to transform rural areas and bring them to the mainstream of the national economy.

The study examined the role of agro-based industries such as tea in the promotion of rural development and identified linkages, which could be strengthened for the benefit of the rural economy. The study mainly focused on an examination of the linkages between the tea factory and rural economy in Borabu division. This involved an analysis of the activities along the various linkage columns; the backward production linkages and the forward distribution linkages. The industry was identified as having weak forward linkages because of the nature of the product, which does not induce other forms of manufacture. However weak the forward linkages may be, they are significant through the effects they have on development in the division. For instance, the

packing of tea creates employment to factory workers who are specifically employed to do so. Marketing ensures that the manufactured tea is marketed locally and internationally hence competing with international companies..

Backward linkages were seen to be the basis of the tea industry in the area. They included activities of land preparation, weeding, pruning and harvesting then transportation to buying centres and to the factory. Areas of weaknesses here included poor husbandry practices and poor infrastructure such as roads. Along each linkage column, employment and income linkages were identified. Backward linkages were however seen as being to alter the standard of living through increase in incomes, employment and infrastructure.

The study found out that all problems identified as facing the tea industry in totality in Borabu revolve round the issue of low production of green leaf, poor infrastructure in some parts of the division, poor management, insufficient labour, poor market prices on tea, inefficient delivery of green leaf to the buying centres and to the factory. To address these problems, the following recommendations were made.

Short-term recommendations

- Farmers to maintain the K.T.D.A. standard plant population of 7135 per hectare.
- Tea farmers to increase their acreages on tea.
- Tea farmers to maintain crop husbandry practices
- Tea farmers to limit involvement of farm workers

- The factory to supply quality fertilizers to farmers at subsidized prices.

Mid-term recommendations

- Factory to employ supervisory staff at the farm, buying centre and factory levels
- Factory to encourage non-tea farmers to plant the crop
- Factory to increase number of factory workers
- Factory to increase salaries of factory workers
- District Officer to limit land sub-division
- D.D.C to set funds for road improvements mean while the factory should rehabilitate the poor roads.
- The farmers and factory workers to improve their expenditure patterns

Long-term recommendations

- Factory to construct more buying centres in areas of deficit and if need be, a factory where appropriate. However, they should consider the amount of green leaf produced and the spatial distribution.
- Ministry of Tourism, Trade and Industry to look for ways and means of reducing the capital intensity of factories so as to employ more labour to perform tasks.

Therefore, it is hoped that the recommendations will strengthen the areas of weaknesses within the linkage pattern and hence enable the industry contribute fully to rural development through creation of more employment opportunities, increase in income and inducing of other multiplier effects within the division. It is also hoped that through this study, the model on linkages will be

used in other tea-producing areas in and outside the country so as to promote the role of the industry in development in general and development in Borabu division in particular.

Areas for further research

The study however has not been exhaustive. Hence, the following area has been identified for further research. A more detailed examination of the marketing process of the manufactured tea should be done and on how their income is distributed and what percentage goes back to the farmer.

BIBLIOGRAPHY

Amann, V.F (1973): **Agricultural Policies In East Africa,** Makerere University Printery, Kampala.

Awuor,R. (1979): **The Relationship Between Kisumu's Industrial Sector and its Hinterland,** Unpublished M.A. Thesis, University of Nairobi.

Bruce, V.W. (1966): **Organizational And Administrative For Agricultural Development**, F.A.O, Rome

Chant, S. (1989): **Women In The Third World**, Edward Elgar Publishing Limited, England.

Cohen, J.M (1987): **Integrated Rural Development**, The Scandinaviah institute of African Studies, Uppsala.

Cohen, F.M. (1989): **Rural Development,** Gower publishing house, England.

Darkoh, K. (1985): Rural Poverty in Africa, Nairobi University Press, Kenya.

Dalberg, K.A (1985): **Beyond The Green Revolution**, Plenum Press, New York.

Dharam, G. (1983): **Agrarian Policies and Rural Poverty in Africa**, ILO Geneva.

Greenshields, B.L (1983): **Rural Development,** Grower Publishing Company, England.

IDS, (1996): Occasional Paper No. 63 on **Agricultural Sector Management Reform And Policy Analysis,** The Kenyan case.

IFAD (1994): **The State of Rural Poverty in Africa.**

Jones, S. (1982): **Rural Poverty and Agrarian Reform,** Allied publishers, Bombay.

Kabura, M.K (1977): **The Role Of Co-Operative Movement In Gatanga Location,** Muranga District, M.A. Thesis (unpublished) University of Nairobi.

Kamuyi, A.J (1987): **Industrial Component Of The Integrated Rural Development Programme**, experience on Ondo state and the implications on the Future.

Kangi, M. (1973): **Small Holder Tea Industry In Ndia Division,** Kirinyaga District Unpublished M.A. Thesis, University of Nairobi, Nairobi.

Kenya Export News (1991): **Savoury Tea and Coffee**.

Kenya Government (1981): **Sessional Paper No. 4 of 1981**, Government Printers, Nairobi.

Kenya Republic of(1999): **National Poverty Eradication Plan 1999-2015 ,** Government Printers, Nairobi.

Kenya, Republic of (1991): **The Tea Act, Cap 343,** Government Printers, Nairobi.

Kenya, Republic of (1997): **Nyamira District Development Plan,** Government Printers, Nairobi.

Kenya, Republic of (1999): **Sessional Paper No. 2 of 1999,** Government Printers Nairobi.

Kenya, Republic of (1978): **Human Settlements Strategy,** Government Printers, Nairobi.

Lele, U. (1975): **The Design Of Rural Development, Lessons From Africa,** John Hopkins Univeristy, Baltmore.

Leonard, D. (1973): **Rural Administration in Kenya**, East African Literasture Bureau, Nairobi.

Maina, S.M (1977): **Thika Community Centre,** M. Arch. Thesis-University of Nairobi, Nairobi.

Ngau, P. (1988): **Rural-Urban Exchange In Kutus Towns And Its Hinterland,** Clark University and the Institute for development anthropology , Nairobi.

Ngau, P. (1997): **Rural – Urban Relations and Agrarian Development in Kutus Area**, Kenya, Ph.D dissertation, University of California, Los Angeles.

Njuguna, P.S.K (1985): **Planning For Water Supply In Rural Areas,** A case study of Kandara Division, Muranga district, Unpublished M.A. Thesis, University of Nairobi.

Nyangito, H. et al (1998): **Kenya's Agricultural Policy And Sectors Performance,** IPAR, Nairobi.

OECD (1996): **Better Policies For Rural Development**, OECD Paris.

Ominde, S. (1970): **Lands and Population Movements in Kenya,** East African Literature Bureua, Nairobi.

Seidman, A. (1972): **Comparative Development Strategies in East Africa,** African Publishing House, Nairobi.

World Bank (1988): **Environmental Considerations For The Industrial Development Sector,** Washington D.C.

World Bank (1993): **Agriculture and Environment Challenges**, International Bank, Washington D.C.

Appendix 1: Household Questionnaire

UNIVERSITY OF NAIROBI
M.A. (Planning) ii

HOUSEHOLD QUESTIONNAIRE TO BE ANSWERED BY HOUSEHOLD HEADS

This is purely an academic research. The interviewer is a second year master of arts student at the above named institution. As part of her coursework, she is required to conduct a research and write a paper (thesis) on a subject of her choice. Therefore, the information provided here will go a long way in enabling her meet the degree requirements. The information given here will be treated with a lot of confidentiality, thanks.

SUBJECT: THE ROLE OF AGRO-BASED INDUSTRIES IN RURAL DEVELOPMENT

Questionnaire number_____ Date _____
Name of respondent (optional) _____
Location _____

1. Occupation of household head .....
2. What is the size of your household?

Name	Age	Sex	Education	Relationship to household head

3. What economic / social problems does your household face in daily life?

Problem	Solution

4. What is the size of your farm holding ? (ha.) .....
5. What crops do you grow?

Crop	Area (ha.)

6. Which other crops have you been growing in the last five years apart from the ones in No. 5 ?

Crop	Year	Area (acres)

7. What problems have you been facing in their production?

Problem	Solution

8. (a) Do you grow tea ? 1. Yes 2. No (tick one) If no, go to question 13.
   (b) If yes, what is the volume of green leaf per month in kilograms? .....
9. (a) How many farm workers do you employ? .....
   (b) What are the wages per worker ? .....
   (c) What is the origin of the workers?

Name of worker	Place of origin

   (d) What is the nature and amount of family labour used in the plot?

Name	Relationship to the household head

10. How many tea pluckings do you make per week? .....
11. (a) Are you able to get all the labour you need for your tea plot ? (tick one)
    1. Yes 2. No
    (b) If no, where else do you get labour from ? .....
12. What is the average income earned from tea and from other crops per year ?

Crop	Income (kshs)	Expenditure
Tea		
Maize		
Beans		
Finger millet		
Passion		
Horticultural		

(proceed to question 15)

13. Which crops do you grow?

Crop	Area (acres)	Income (kshs)	Expenditure

14. Why don't you grow tea ? .....

.....

.....

15. (a) Is there a conflict of interest between growing tea and other crops in terms of labour and land available ? (tick one)

1. Yes 2. No

16. Which is the best paying crop ?

Crop _____

Amount _____kshs. per year.

17. Which is the most demanding crop in terms of labour attention ?.....

18. How do you transport your tea to the buying centre ? (tick one)

i. Walk and carry on our heads
ii. Use a family vehicle/tractor
iii. Use a hired vehicle
iv. Use a donkey
v. Use a wheelbarrow

19. Is the buying centre conveniently located to serve you ? why?.....

.....

20. What problems do you experience in marketing your green leaf ?

Problem	Solution

21. What other problems do you experience in tea production ?

Problem	Solution

22. Do you foresee any hope for Borabu division in terms of development as far as tea production is concerned ? Explain. .....

.....

.....

THANK YOU FOR YOUR CO-OPERATION

Appendix 2 : Factory Personnel Questionnaire

UNIVERSITY OF NAIROBI
M.A. (Planning) ii

FACTORY PERSONNEL QUESTIONNAIRE

This is purely an academic research. The interviewer is a second year master of arts student at the above named institution. As part of her coursework, she is required to conduct a research and write a paper (thesis) on a subject of her choice. Therefore, the information provided here will go a long way in enabling her meet the degree requirements. The information given here will be treated with a lot of confidentiality, thanks.

SUBJECT: THE ROLE OF AGRO-BASED INDUSTRIES IN RURAL DEVELOPMENT

Questionnaire number_____ Date _____
Name of respondent (optional) _____
Location _____

1 When were you employed in this factory ? _____

2. Which activities are you engaged in ?

_____

_____

3. How much income do you earn per month ? kshs. _____

4. How do you spend the income ?

Expenditure	Amount

5. What problems do you experience in the course of your work ?

Problem	Solution

6. What is your opinion about the management of this factory ?

_____

_____

7. Given an opportunity, would you opt to work in another factory elsewhere ?

   Yes ☐

   No ☐

8. If yes, give reasons .

   _____

   _____

9. In your opinion, how is working in the factory helped you ?

   _____

   _____

   _____

10. Any other comments

    _____

    _____

    _____

THANKS FOR YOUR CO-OPERATION

Appendix 3 : Business Questionnaire

UNIVERSITY OF NAIROBI
M.A. (Planning) ii

BUSINESS QUESTIONNAIRE

This is purely an academic research. The interviewer is a second year master of arts student at the above named institution. As part of her coursework, she is required to conduct a research and write a paper (thesis) on a subject of her choice. Therefore, the information provided here will go a long way in enabling her meet the degree requirements. The information given here will be treated with a lot of confidentiality, thanks.

SUBJECT: THE ROLE OF AGRO-BASED INDUSTRIES IN RURAL DEVELOPMENT

Questionnaire number _____ Date _____
Name of respondent (optional) _____
Location _____

1. Do you grow tea ? Yes _____ No _____

2. What kind of business activity are you engaged in ?

_____
_____

3. Whicch is your nearest market centre ? _____

4. Why have you decided to locate you business activity here ?

_____
_____

5. Where did you get your initial capital to start the business here ?

_____
_____

6(a) Do you operate another business activity elsewhere ? Yes _____ No _____
(b) If yes, what type ?

Type of business	Place

6. How much income do you get from this business per year ? kshs. _____

7. How do you spend it ?

Expenditure	Amount (kshs)

8. In your opinion, how would you rate the benefits you get from the business ? Tick one.
   1. Very little
   2. Little
   3. Okey
   4. Good
   5. Very good

9. What problems do you experience in carrying out the business ? Have you made any attempt to solve them ?

Problem	Solution