

\\ PLANNING FOR AGRICULTURAL PROCESSING PLANTS (FACTORIES)
WITH SPECIAL REFERENCE TO EMPLOYMENT CREATION: A CASE
STUDY OF MERU DISTRICT, KENYA.

BY

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A Thesis submitted in partial fulfilment of the requirements for the Degree of Master of Arts (Planning) in the Department of Urban and Regional Planning, Faculty of Architecture, Design and Development, University of Nairobi.

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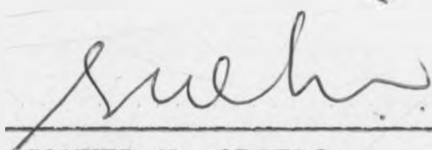
DECLARATION

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

Signed 

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This Thesis has been submitted for examination with my approval as University supervisor.

Signed 

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DEDICATION

This Thesis is dedicated to my Paternal Grandmother, Mrs. Kirigo M'Mutungi (Taata) who died in July, 1972 of unknown disease. May Her Soul Rest in External Peace.

Amen.

ACKNOWLEDGEMENTS

A work of this nature owes much of its growth and maturity to many people from various walks of life and whom I am unable to mention here. However, I would like to thank the following for their assistance in the process of my educational growth in relation to this work.

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ABSTRACT

Increasing attention is being devoted to the serious unemployment problems in the less developed countries by a variety of institutions and individuals. In particular, the ILO through its World Employment Programme has been at the forefront of research efforts dealing with various aspects of these problems in the short run while more permanent solutions are formulated.

The unemployment problem is accentuated by sheer population growth with few alternative employment opportunities off-farm. Further the problem is intensified and aggravated by the system of education in the Less Developed Countries, Kenya included, which prepares school leavers for urban White-Collar jobs. In fact even young school leavers with farm lands do not want farming. They aspire for white-collar jobs.

The Kenya's ever increasing population has created unemployment and underemployment in agriculture. It is understood that land is a finite commodity which contracts and expands in response to human effort and behaviour. Thus the ever increasing population will strain the existing available land. Consequently, there would be low agricultural production, under-employment and unemployment. From this, it is clear that the governments of less developed countries, Kenya included, are looking for alternative employment opportunities (off-farm) to engage their labourforce.

The increasing of rural income in Kenya can only be successful if farm population pressures are considerably reduced. This would require the creation of non-agricultural income earning opportunities in situ. Therefore this study has adopted agricultural processing industries as a way of reducing unemployment in the rural areas using Meru as a case study. The main objective of the study is to examine and assess the agricultural resources which have the scope for development of agricultural processing industries in the rural areas in order to create employment opportunities and raise incomes.

The field study findings revealed that agricultural processing industries, which tend to locate in the rural areas have a vital role to play in the process of rural development in terms of employment creation and incomes.

Also the findings arising from this study are that the district has a high agricultural potential for the development of agricultural processing plants (factories).

This study therefore recommends that an integrated approach to rural development process should be adopted. Firstly, there is need to remove the problems/constraints which may militate against the rural development efforts. Secondly, agricultural productivity should be boosted

so as to provide surplus production for the agricultural processing factories which will create employment for the rural population. The boosting of agricultural productivity will not only provide surplus for agro-based factories, but will also increase employment in agriculture.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 STATEMENT OF THE PROBLEM AND ITS SIGNIFICANCE

The Less Developed Countries are facing a serious problem of unemployment. In fact, for the last one decade or so, it has been the main agenda under serious discussion. Of the factors that have contributed to the present crisis, none is more important than the sheer population growth. This has led to ever greater cohorts of young people seeking employment. Let us consider first the case of Latin America where the problem has been most serious. During the 1940's the annual population increase in this continent was 2.3% which rose to 2.8% in the next decade and almost 3% in the 1960's.¹ The table 1 below shows the estimated labourforce for Latin America between 1960 and 1980.

TABLE 1: ESTIMATED ECONOMICALLY ACTIVE POPULATION OF LATIN AMERICA IN 1960, 1970 AND 1980

REGION	1960	1970	1980	INCREASE 1960-1970	INCREASE 1970-80
TROPICAL S. AMERICA	36.5	47.4	63.5	10.9	16.1
CENTRAL AMERICA	15.0	20.7	28.8	5.7	8.1
TEMPERATE S.AMERICA	12.3	14.3	17.0	2.0	2.7
CARRIBEAN	7.7	9.6	12.1	1.9	2.5
TOTAL	71.5	92.0	121.4	20.5	29.4

Source: Y. Sabolo Page 44.

1. Y. Sabolo: Sectoral employment growth, the Outlook for 1980;
44 and 67: United Nations Document.

The unemployment problem in Africa is certainly equally acute. By 1960 it was estimated that Africa had a total of 112.1 million people who were economically active and needed some gainful wage employment.² By the end of this century, this figure will have doubled.

The unemployment problem with all its subsequent socio-political and economic problems is becoming more serious in nearly all the less developed centres, Kenya included. In fact, it has become Kenya's most difficult and persistent problem. In 1977, President Daniel Arap Moi told, leaders' Conference at the K.I.A. that unemployment in Kenya was "a potential social bomb" of which every effort must be made to minimise the explosiveness.³

The crisis has been accentuated by the sheer population growth rate which is greater than employment creation in the country. A growing population means a growing labourforce which need to be counteracted.

The population growth rate in Kenya is rapid. The average annual growth rate between 1962 and 1969 was 3.4 percent rising to about 3.8% between 1969 and 1979.⁴ This has led to ever greater cohorts of young

2. Y. Sabolo Ibid.

3. The Weekly Review, February 7, 1986 pp. 5.

4. National Development Plan 1984-88 pp. 5.

people seeking employment for the first time. In Kenya wage employment in the modern sector has grown over the period 1976 to 1981 at an annual average rates of 3 percent which is lower than the growth rates of population and labourforce. The labourforce has grown faster and employment has grown at a slower rate. This has meant a growing proportion of the labourforce remaining unemployed.

TABLE 2: EMPLOYMENT AND IMPUTED UNEMPLOYMENT

	1976	1981	GROWTH RATE 1976-81
Labourforce Employment	5,473,000	6,598,000	3.8
Small Sacle Agriculture	2,665,000	3,040,000	2.7
Pastoralists	390,000	445,000	2.7
Modern Sector	915,000	1,086,000	3.5
Rural Non-Farm	990,000	1,180,000	3.6
Urban Informal	125,000	157,000	4.7
TOTAL Employment	5,085,000	5,908,000	3.0%
Residue	388,000	690,000	12.2%

Source: National Development Plan, 1984-88 pp. 7.

The table 2 reveals that there is a residue of labourforce which is neither employed in agriculture

nor in wage employment (modern sector). They are openly unemployed; and this can be seen with our naked eyes. Between 1976 and 1981 this residue was as high as 12.2% of the total economically active population.

In 1981, the National Labourforce was 6,596,000 people and only 1,086,000 were employed in modern sector whereas, the rest were either engaged in agriculture, rural non-farm activities, urban informal activities or unemployed.⁵

Apart from high population growth rate, other factors have contributed to unemployment problem in Less Developed Countries Kenya included. The prevailing educational system aims at providing some form of free primary education for as many children as possible. This has not only created expectation on a scale unprecedented but also profoundly influenced the job aspirations of hundreds of thousands of young people, more than half of whom have not even completed or never will complete their basic primary education. In most cases they aspire for non-rural employment and in many cases this has resulted in a large drift of young primary school leavers towards the urban areas.

5. Statistical Digest, 1971.

Also the rural-urban drift has been brought about by the inability of the land to provide employment for growing population. For limited periods of the year there is work to be done, indeed there is often a shortage of manpower during the planting and harvesting seasons. These people migrate to urban areas especially during slack season to look for jobs or to engage in casual employment returning home in the peak agricultural season to assist with planting and harvesting. Some do not return home at all. Their plots of land are so small to engage them.

Indeed good agricultural land is already scarce and population increase leads to increasing fragmentation of the land with a frequent tendency; if the size falls below a certain critical level, to cover the standard of husbandry; then farmers' daughters and sons will have no alternative but to seek employment opportunities elsewhere. Otherwise, the underemployment will prevail and results in low productivity in almost all the sectors of the rural economy.

It is very clear that creation of job opportunities in modern sector has by no means kept pace with the growth of labourforce. For example, between 1964 and 1971, the modern sector wage employment in the public

and private-sectors increased approximately by 2.3% annually over the whole country; during that period the labourforce increased by more than 3% annually.⁶

According to 1974 and 1979 Statistical Abstracts, agriculture alone accounted for 46% of the total private wage employment in the eleven years 1967-1977 as compared to manufacturing sector which accounted for only 17% of the total private wage employment on an average in the same period.⁷ We observe that agriculture has been performing better than manufacturing sector with respect to employment both in absolute and relative terms. Although employment figures in agriculture are impressive, the sector has inherent (in built) underemployment and seasonal (structural) unemployment. The unemployment situation is higher although the labourforce figures indicate that high percentage (46%) is engaged in agriculture. This is true for LDC's, Kenya and even Meru District.

One striking feature of employment in Kenya's agriculture is that while agricultural GDP rose by 574% from £56.21 million in 1967 to £378.56 million in 1967-1977 employment in agriculture rose by only 51% in the same period. Wage employment in manufacturing

6. Kenya Statistical Digest, June 1971.

7. Central Bureau of Statistics: Statistical Abstract: 1974 and 1979: 8: CBS 1974 and 1978 Ibid.

rose quite rapidly from 56,800 in 1967 to 117,000 in 1977, a 108% increase.⁸ The share of manufacturing sector in the total wage employment still is so low that Kenya will have to rely on agriculture for quite sometime as the main source of incomes and employment for her fast growing population. It is projected that by the year 2000, Kenya is likely to have a labourforce of 10.8 million at an annual growth rate of 3.3 percent.⁹ According to the Chief Secretary of Kenya, Mr. Simon Nyachae (1985) Kenya's economy is currently capable of creating only 60,000 jobs a year. At that rate, only 1.8 million jobs will have been created by the year 2000 which means over two million Kenyans may be out of work in the next 15 years.¹⁰

Meru with its 830,000 or so inhabitants is among the most populous districts in Kenya facing steadily increasing unemployment. The reason is to be found partly in the rapid growth of the population and the fact that there are fewer alternative employment opportunities off-farm. The average annual growth rate of population is certainly higher than 3.3% and

9. Kenya Statistical Digest 1971 op. cit.

10. The Weekly Review (1986) February, op. cit.

this is likely to be even higher in the year 2000. Currently the farm holdings (average) is 0.71 hectares/person. This figure is likely to decrease by the end of the century. With assumed population growth rate of 3.4 percent the projected agricultural population by 2000 A.D. will be 1.7 million people. This population is likely to strain the agricultural potential of the district. The existing resources are not likely to be able to sustain this tremendous growth rate of population. Thus there is a likelihood that the land will not be able to provide employment for growing population. The people are likely to be pushed out of agricultural economy that can no longer be expanded. The population increase will leads to increasing fragmentation of the land. Consequently this leads to underemployment and unemployment in agriculture; and the sons and daughters of the present day farmers must leave to seek their fortunes elsewhere. Hence rural-urban drift.

In 1981, the district had a labourforce in the of 385,697 people; 24,566 and 7458 were engaged in wage employment and self-employment respectively. Of the 24,566 who were engaged in wage employment only 563 persons were in manufacturing sector.¹¹ (Table 3)

11. Labourforce defined as 95% of males and 45% females between ages 15 and 59 years.

TABLE NO. 3: WAGE EMPLOYMENT IN MERU

	MALES	FEMALES	TOTAL
1976	14,408	4,811	19,219
1981	18,860	5,706	24,566

Source: Kenya Statistical Digest, 1981.

A notable feature is that there has been a slow increase in the number of persons engaged in wage employment whereas the labourforce has increased at a higher rate.

The table 4 shows clearly that many people had to remain on the land practising agriculture at the time (1976 and 1981). The problems of rural development in the district revolve around the issues of population pressure on land and non-availability of off-farm employment opportunities for its inhabitants. There is prevalence of unemployment and underdevelopment in agriculture. The fragmentation of land especially in high potential areas is threatening. The labourforce has grown faster and employment opportunities has grown at a slower rate. This shows that agriculture has to be depended on as the one to solve to a large extent the increasing levels

TABLE NO. 4:

WAGE EMPLOYMENT BY INDUSTRY IN MERU

SECTOR YEAR	AGRICULTURE AND FORESTRY	MINING AND QUARRYING	MANUFACTURING	ELECTRICITY AND WATER	CONSTRUCTION	WHOLESALE RETAIL TRADE RESTAURANT AND HOTELS	TRANSPORT AND COMMUNI- CATION	FINANCE INSURANCE REAL ESTATE BUSINESS	SOCIAL PERSONAL SERVICES	TOTAL
1976	5,434	28	439	37	332	863	322	169	11,595	19,219
1981	8,084	19	563	63	1,120	1,712	228	184	12,593	24,566

Source: Kenya Statistical Digest, 1981.

of unemployment in Kenya since the manufacturing sector has not been able to do so. Even agriculture will not be able to absorb the ever increasing labourforce.

It is evident that with the ever-increasing population there will be a serious population pressure on land leading to underemployment and unemployment in the rural areas. Hence people will be pushed out of land to seek jobs elsewhere. Majority will end up in urban areas. The rural-urban drift will be accentuated by the inherent (in-built) underemployment and unemployment in agriculture and the problem of school leavers and their attitudes towards wage employment and manual labour. Infact youngsters lack interest in farming. Even youngsters who have farmlands have very little urge to take up agriculture . They aspire for white-collar jobs.

So the problem of unemployment is likely to worsen in the future in the district. Presently the low level of employment generation must be stepped up to cater for these increases in population. The projected population (labourforce) by the year 2000 will be 716,000 persons (46.7%). This potential labourforce will need wage earning employment.

Outmigration alone is not a viable solution, because even those other districts have their own population to cater for. Other solutions include increasing productivity, family planning and planning for industries.

This study has adapted the last solution: Planning for industries. According to Physical Planning Department (1970) industrialisation is the principal means of providing new jobs and as a means of stimulating investment and re-investment.¹² In fact, setting up of industries in order to offer jobs is the first line of defence to battle against unemployment and under-employment in agriculture.

Industries are capable of absorbing labour which cannot be profitably employed in agriculture. The overpopulated high agricultural potential countries or regions are likely to experience underemployment and less food output per head of working population if the population continue to increase without any other absorbent sector except- agriculture. Thus in the rural areas of Kenya, industries have a vital role to play in terms of providing employment, raising rural farm incomes and provision of basic infrastructure to the rural population.

12. Physical Planning Department - Human Settlements in Kenya: A strategy for Urban and Rural Development, Government Printer 1970.

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12. Physical Planning Department - Human Settlements in Kenya: A strategy for Urban and Rural Development, Government Printer 1970.

Mathieson, (1973)¹³ Argues, "the development of industries has come to be regarded as the most convenient means which this world can offer of attaining high or atleast better standard of living. It has been regarded as the hallmark of progressive nationhood. Those countries which in recent years have achieved political independence like Kenya, look at planned development of industries to set, as it were, a seal on their new status".

It very clear from this that industries are vital in development and they do raise the living standards of the people, not only by providing employment and incomes but also goods and services needed by the rural population.

According to Power (1971) industry could act as dumping work place for workers who are simply squeezed out of agriculture due to population pressure on land.¹⁴

Meru is exclusively an agricultural district and it will remain so because it has no commercial minerals. Agriculture will remain as the sole major employer. Consequently, seasonal unemployment and

13. Mathieson, (1973): The location of Industries-
Prentice Hall.

14. J.H. Power - the role of protection in Industrialisation policy - I.D.S. Discussion Paper No. 121, University of Nairobi, 1971.

underemployment is very prevalent in the district. In her industrialization policy, the priority should be geared towards the following types of industries:

- (a) agricultural processing industries and others based on the natural resources; and
- (b) labour-intensive industries; and industries which are likely to expand the traditional agricultural sector.

This study seeks to examine the agricultural resources which have scope for development of agricultural processing industries (plants) in order to provide employment opportunities and raise rural incomes. Hence raise living standards of the people in the rural areas.

In order to reduce underemployment and (seasonal) unemployment in the rural areas there is need for establishment of agricultural processing industries in the rural areas which with the existing pattern of agricultural production will have to be limited to processing. Planning for these industries (Plants) is likely to ensure that the best use was made of the available labour, raw materials; in addition to absorbing surplus labourforce from the rural areas.

Also if the farmers produce and they cannot dispose off surplus profitably, then they have got no incentive to innovate or even produce more. Hence of the solutions is agricultural processing industries for utilizing potential surplus production. In this case there will be higher income from commercial farming, creating of employment opportunities resulting in high incomes and hence high standards of living, creating incentives to produce more.

Thus this study is a detailed analysis of agricultural resources which have the scope for development of agricultural processing industries in order to create employment and raise rural farm incomes.

1.2 STUDY OBJECTIVES:

The overall objective of this study is to examine and assess the agricultural resources which have the scope for development of agro-based industries in the rural areas in order to increase incomes, create employment opportunities and increase availability of goods and services to the rural population.

The study, therefore provide answers to the following questions:

- (a) What are the agricultural resources which have the scope for development in the district;
- (b) What are the agro-based industries which are likely to boost rural development; which in Kenya are considered to revolve around the issues of creation of employment, improvements in levels of incomes and the quality of socio-economic infrastructure; and
- (c) The planning approaches which could be offered in the light of the evidence gained from an examination of (a) and (b) above.

1.3 SCOPE AND LIMITATIONS OF THE STUDY:

Subsequently, while retaining most of the original objectives the current research scope embraces the following areas:

- (a) an examination and study of raw materials availability to processing industries;
- (b) determining domestic and external market trends regarding consumption of the products;
- (c) establishing the level of basic infrastructural development for transportation and storage of fresh and processed products; and

- (d) examining institutional set up that may facilitate industrial development in the district.

In the light of evidence gained from an examination of (a), (b), (c) and (d) above, this study will provide a framework into which agro-industries can be developed to create employment opportunities.

With the above tasks completed this study has attempted to:

- (i) assess the contribution of agro-industries in the process of rural development: creation of employment opportunities, increased rural incomes and improvement of basic infrastructure.
- (ii) draw conclusions regarding the significance of agricultural industries; and their impact on the regional economy in form of multipliers. This would enable one to determine whether a particular agricultural processing industry has beneficial effects on the regional economy in form of backward and forward linkages.

This study is operated at a district level using the current administrative boundary. This is the basic unit in which the investigation was carried on. The study focusses on agricultural resources where it has examined the agricultural inventory analysis and planning.

However given constraints of time, finance and other resources it was difficult for a thorough study of all agricultural resources (crops and animals) in the district. Hence this study focusses on the major agricultural activities: coffee, tea, cotton, tobacco, maize, citrus fruits and mangoes, potatoes, tomatoes, cabbages, milk, hides and skins. Other agricultural activities mentioned but which have unrecognised scope for development are: Pyrethrum and sunflower. The

TABLE 5: MAJOR AGRICULTURAL ACTIVITIES

CASH CROPS (INDUSTRIAL)	FOOD CROPS	OTHERS
Coffee	Maize	Milk
Tea	Beans	Hides &
Cotton	Fruits	Skins
Tobacco	Mangoes	
Pyrethrum	Potatoes	
Sunflower	Tomatoes	
	Cabbages	

Source: Author's Survey.

livestock resources included in this study because of their products (milk, skins and hides) are: goats, sheep and cattle.

1.4 ASSUMPTIONS/HYPOTHESES:

In order to achieve the above objectives study assumptions have been made as follows:

- (i) that the population will continue to rise; hence there will be an increase of labour-force;
- (ii) that agriculture will remain the mainstay of the economy in the district;
- (iii) that provision of employment opportunities will raise the socio-economic status of the rural inhabitants;
- (iv) that exploitation of resources (specially agriculture) will significantly minimize the problem of unemployment and underemployment; and
- (v) that district has a sound resource base especially for agro-industries.

1.5 OPERATIONAL DEFINITIONS

Through out this study many terms explained below have been used.

1. "Agro-based industries and "agricultural processing plants" are taken to be synonymous. These are establishments concerned with converting agricultural raw materials of vegetable (and livestock) types into more useful forms; also referred to as "processing" which includes both fabrication and manufacturing. Kenya's agricultural processing plants (industries) fall into 2 major groups: (a) agricultural food processing (AFP) and (b) non-food processing (ANFP) (Ogendo, 1967: 3).
2. In this study Timber milling is included in agricultural processing.
3. "Factory"; "Plant" and "industry" are used interchangeably; which is a manufactural establishment. The focal point which fulfils the following three functions: (i) assembles raw materials in an establishment, (ii) raises the usefulness by changing their forms; and (iii) transfers these more valuable commodities to other places (marketing) (Alexandar, J.W.:1964).

4. The "location factor" refers to any phenomenon which influences the location of an industry:

5. The "operatives" are those people who are essentially engaged in manual work, directly associated with actual production of goods and/or services. The number of operatives exclude purely administrative technical, clerical and other employees (UN 1953).

6. In this study rural development will be defined as improving of the living standards of the mass of the low income population residing in the rural areas and making the process of their development self-sustaining. This will include, increased production incomes and employment; provision of social, economic and physical infrastructure; and the promotion of such other activities that are complementary and which make the process of growth both self-sustaining and self-generating and contributes to the national economy.

7. Industrialization:

According to Sutcliffe a country or a region would be counted as industrialized if:

- (a) 25% or more of its G.D.P. arose in the industrial sector.

- (b) If atleast 60% of the industrial output is from manufacturing; and
- (c) If atleast 10% of its total population is employed in industry. (R.B. Sutcliffe: 1971).

To what extent can Kenya or even Meru for that matter be regarded as industrialized?

8. In this study unemployment will be defined to consist of those who have zero incomes or work zero hours and who are seeking jobs, but are unable to find them (Sessional Paper No. 10 1973 on Employment).

1.6 RESEARCH METHODOLOGY

(a) METHODS OF DATA COLLECTION

Three major methods of data collection namely questionnaire, personal interviews (and observations) and secondary sources were deployed in this study.

Questionnaires were administered in gathering information on: employment situation, incomes, basic infrastructural facilities, raw material requirements, shortages experienced, demand for the product

(local and extend markets); impact costs of setting a similar factory/industry and the by-products from these industries. Also the factory/industry managers were asked to give their opinions on how the by-products (from the industries) could be used. These questionnaire were administered to twenty six agro-industries in the district.

The selection of factories where the questionnaires were administered was done randomly. The sampling was adapted in selecting the coffee factories, tea factories and sawmills to be interviewed. For the other factories, there was not much choice, because there was only one of each factory. All in all, twenty six factories were interviewed: 20 coffee factories (10%), a tea factory (25%) a maizemill, a cotton ginnery and two saw milling industries.

The first task of the field survey involved physical survey and physical count of economic activities. It was a reconnaissance of personal observations of the resources (human and non-human); and the level of infrastructural development in the district.

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Personal interviews used in the study were of two types: informal interviews and schedule interviews. Informal interviews were held with officials of various government and parastatal bodies involved in the administration and management of agricultural activities in the district. The parastatal bodies interviewed included: K.T.D.A.; Coffee Board of Kenya etc. All Commodity Boards were interviewed. The following officials were interviewed:

(a) Ministry of Agriculture and Livestock Development.

- (i) District Agricultural Officer
- (ii) District Crops Officer
- (iii) District Livestock Development Officer
- (iv) Horticulture Officer
- (v) District Coffee Officer
- (vi) Pyrethrum Officer.

(b) Office of the President.

- (i) District Development Officer
- (ii) D.O's I and II.

Other officials visited for informal interviews and discussions were:

- K.I.E. , Manager, Meru Branch
- K.T.D.A. Secretary to the Board (Nairobi)
- C.B.K., Administrative and Publicity Officer
- K.P.C.U., Publicity Officer
- M.C.F.C.U., Statistical Officer
- Meru South Farmers' Cooperative Union, General Manager.
- Mariara Coffee Society, Senior Manager.
- Officials of the Ministry of Commerce and Industry specially those of Industry Department.
- Officials of I.C.D.C. - Industrial Promotion Centre.

Scheduled interviews were used for District Crops Officer and the District Agricultural Officer.

Secondary sources of data were mainly the Annual Reports of the K.T.D.A.; Coffee Board of Kenya; Kenya Planters' Cooperative Union; District Annual Reports by Ministry of Agriculture and Livestock Development; District Development Plans; Statistical Abstracts I.C.D.C. feasibility reports; Kenya Atlas; Meru District Topo Sheets, and other documents which were deemed relevant to this study.

(b) DATA ANALYSIS

Because of inavailability of detailed data and because the study could not be thorough given the difficulties discussed below; through out the analysis both qualitative and quantitative methods have been deployed.

Qualitative applies to all those aspects of the study which are either not measurable or are partially measurable; for example the standard of rural houses could not be precisely measured.

Quantitative applies to all those aspects of the study which are comprehensively measurable like employment and incomes.

With the available data, it was decided to use descriptive content analysis, tabulation, ratio and percentages in data categories. Hence simple data statistical techniques are deployed through out the analysis.

1.7 RESEARCH LIMITATIONS:

Meru being an enormous district (992200 hectares) it was rather difficult to travel the whole district with the limited resources which were at the disposal.

This led to incomplete and incorrect data.

The major problems experienced in the field was data inavailability. This was evident in the interviews as factory managers were reluctant to release the vital statistics especially those relating to incomes. Thus figures of production had to be used to calculate incomes using the past years' rates of payment for their crops. Factory Managers left some questions unanswered and others partially answered. Some factories, however, indicated that the material required would involve them in unnecessary research for which they were not prepared or they had no time.

The next series of visits were to the non-responding factory managers. Many of these managers limited the information to problems they encountered no more. In such cases there was need to devise alternative techniques for extracting information Timber Industries which were on the verge of closing down at the time of this field survey were adamant to release information.

1.8 LITERATURE REVIEW:

In order to put this study in its proper perspective atleast three types of work should be reviewed; that is, rural development, agricultural

development and industrialisation literature. The three types of work should be reviewed to help us to appreciate the importance of agriculture and industries in the process of rural development. The students of rural development use agricultural development and rural development interchangeably. However, they contend that improvement in the living standards of rural people is central to any strategy that aims at altering the pace of development in the less Developed Countries, may it be industrial strategy, agricultural strategy or any other sector - so to speak.

Mbithi (1975) argues that rural development is "the sum of multigoal, multistrategy, interagency programmes aiming at increasing incomes, employment and social welfare amenities level of living and people involvement; the goal of increasing the productivity of sedentary employment"¹⁵. He sees rural development as those programmes geared towards increasing employment opportunities, rural incomes and provision of basic infrastructure.

Asiz (1978) argues that rural development is a social transformation of the rural society and adoption

15. Phillip M. Mbithi (1975) Spontaneous Settlement Problem in Kenya, E.A.L.B. pp. 17.

of agricultural strategy that would bring about technical transformation in agriculture hence there would be a transition from agricultural to rural development. He goes on to say that the major problems of Third World Countries are: absolute poverty, unemployment and inflation; thus the starting point of rural development is the objective of eliminating rural poverty and meeting everyones basic needs in an egalitarian and positive social environment.

He further underscores the importance of agriculture in the process of rural development:

"A rapid and sustained increase in agricultural productivity and agricultural production is the first important objective of rural development".¹⁶

He fears for the countries with limited land resources for it is very unlikely that land will provide a continuous employment without any off-farm activities. He concludes his discussion by re-emphasising the fact that agriculture is a vehicle for rural development. "rural development is not possible without agriculture and that an increase in agricultural productivity would show a positive change in rural areas."¹⁷

16. S. Asiz (1978) Rural Development: learning experience from China, the Macmillan Press pp. 53.

17. Ibid. 18: Daily Nation, Thursday, Jan. 2, 1986.

For a country like Kenya, it would not be easy to divorce rural development from agricultural development. Kenya's agricultural sector has long been regarded as the main source of livelihood for the majority of the people. It is estimated that about 85% of the people live in the rural areas and 78% of the Kenya's labourforce is engaged in the agricultural sector. It generates about 1/3 of the Gross Domestic Product.¹⁸

Uma Lele (1975) contends that rural development is an increase in the economic and social (and environmental) welfare and involves a positive change in the standards of living of the people in the rural areas. Thus she defines rural development as improving the living standards and making the process of their development self-sustaining. The betterment areas are: family nutrition, raising incomes, sustained good health basic subsistence food supply and so on. She argues that raising standards of subsistence rural sector is essential:

"not only as a holding operation until industrialization can advance sufficiently to absorb the rural exodus but frequently as the only logical way of stimulating overall development."¹⁹

18. Daily Nation, Thursday, Jan. 2, 1986.

19. Uma Lele (1975): The Design of Rural Development Perspectives from Africa.

She recognises the importance of industrialisation which will act as a dumping workplace for rural exodus population this also is likely to stimulate overall development, in both urban and rural areas.

Omari (1976) contend that rural development takes a wider perspective and that development embraces overall societal development.²⁰ He refutes the contention by Tanzanian scholars that rural development means agricultural development and political development. In his opinion:

"----development has to do with the induced planned aid deliberate change which aims at improving the life conditions of the masses in particular areas as situation so as to achieve a set of defined goals"²¹ thus societal development looks not only in one area but a whole spectrum of rurality.

Nyerere (1967) emphasizes the importance of agriculture in rural development:

"Our future lies in the development of our agriculture and in the development of our rural areas"²².

20. C.K. Omari (1976) The Strategy for Rural Development Tanzania Experience - E.D.C.B.

21. Ibid

22. J.K. Nyerere: Socialism and Rural Development, Dar 1967.

He underscores the importance of agricultural sector in terms of job creation, raising, rural incomes, in addition to providing food for subsistence. Also agriculture stimulate the development of agro-industries in the rural areas.

Obwa (1977) contend that rural development must involve altering of the structure of the society by social, economic and political changes that have to take place in the rural areas that greatly affect the lives of the people residing in these areas. Rural development is a highly transformative exercise. To Obwa, the objectives of rural development should be:

- (i) to eliminate poverty by increasing agricultural production, incomes and employment opportunities, and
- (ii) widespread provision of rural welfare amenities such as education facilities, medical services, water supply and so on; such that poverty disease and ignorance are eliminated in the rural areas.²³

23. Oiro Obwa - The Effectiveness of Growth and Service Centres policy as an Instrument of Rural Development in Kenya, I.D.S. Working Paper No. 317.

At this point, it is essential to state that industrialisation is one rural venture which will increase incomes, employment opportunities and basic infrastructure. For development to be self-sustaining and self-generating, agricultural development must be complemented and supplemented by industrial development so as to achieve a balanced and nationally integrated economy. Industries are essential for the economics of the under developed countries because they can generate employment and incomes that can stimulate greater productivity and bigger domestic markets as a result of raising domestic consumption and raising standards of living of the population.

According to Paris Andreou (1977) rural development must effectively improve the economic viability of agriculture as well as stop the flow of young school leavers to the cities.²⁴ He contends that effective development thrust may be in two major directions: non-agricultural and agricultural. In non-agricultural efforts, he cites rural infrastructure access and transportation, medical, education services and so on. Good accessibility and transportation means

24. Paris Andreou (ed) 1977 - Rural and Development Economics - E.A.L.B.

effective marketability of potential commercial, agricultural produce, a situation which would raise farmers' earning power and incentive for increased productivity.²⁵

Andreou goes on to spell out three major problems likely to be encountered in the agricultural development effort:

- (i) The conflict between self-sufficiency in food and production of primary commodities for export in the national priorities has to be resolved quickly in order to avoid inadequacy of food and foreign exchange or both;

- (ii) Further conflict arises as to what level of mechanisation should be introduced. He concedes that capital intensification increases productivity and cheapens output whereas labour intensification helps to solve if only partially, the problem of unemployment.²⁶

25. Ibid. p. 117.

26. Ibid pp. 118.

However, he argues that choice has to be made between the two alternatives whether capital intensification or labour intensification in agricultural development where the later would help to solve the problem of unemployment and low productivity concurrently.

Heyer et. al. (1978)²⁷ argues that there are certain indicators of development which if increased, the rural dwellers will experience a positive change in socio economic environment. These indicators are youth employment, rural incomes, education and training; to mention a few.

A definition of Rural Development accepted by Working Committee on Human Environment in Kenya reveals:

"---- a series of quantitative changes occurring among a given rural population and whose emerging effects indicate in time arise in standard of living and favourable changes in the way of life".²⁸

Agriculture being the mainstay of Kenya economy is depended upon in terms of employment, incomes,

27. Heyer, et. al (1978) Rural Development in Kenya - E.A.P.H.

28. S.H. Ominde: Urbanisation and Environment in Kenya, 1972 pp. 2.

nutrition and so on. Consequently, agro-industries cannot be divorced from agriculture which supply raw materials in the nature of backward linkage. The industries create employment opportunities in addition to providing goods needed by the rural population.

Mukhebi²⁹ investigates the feasibility of generating substantially higher income and employment in Kenya's small scale agriculture. He assesses the impact of land-labour ratio upon farm enterprise combination. He found that the ratio is growing at an alarming rate especially in high agricultural potential areas. He also measures and contrasts the income and employment generating capacity of two agricultural development strategies: One which pursues the income maximizing objective and small scale agriculture. In the final analysis he concludes that small scale agriculture employs majority of agricultural labourforce. In his recommendations he calls the Government to pay more attention to small scale agriculture.

Saupe et. al.³⁰ calls for integration and participation of small scale farmers in agricultural

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29. Mukhebi in Rural Development: Growth and Inequity, Papers (ed) Bruce L.G.
 30. W.E. Saupe in Rural Development, Growth and inequity contributed papers at the 18th I.C.A.E. (ed) Bruce L.G.

development. In this paper the author spells out the incentives which may be used by the government of less developed countries to experience a sound agricultural development. Commodity price support programmes is one of the incentives. Government may establish a guaranteed price to its farmers at a level well above the world price. In this situation the government is likely to promote national self-sufficiency in the production. The high production will bring about self-sufficiency, that is, food and raw materials for agricultural processing industries.

Ahsan and Rashid³¹ castigates the modern varieties of agricultural crops which they say have hampered agricultural development in the Third World Countries. These high yielding varieties are increasingly looked upon as a major source of additional food grain required to attain self-sufficiency. However, they contend that there has been reluctance by farmers to unfamiliarity and high costs of new technology required in this respect. They conclude that there should be public participation before such high yielding varieties are introduced to farmers.

31. S.M. Ahsan and S. Rashid - Rural Development, Growth and Inequity - Ibid.

Heyer (1976)³² argues at length on the impact of population growth on the meagre land resources. He commences by narrating an economic assessment of the progress that has been made in Kenya's agricultural sector. He gives a systematic account of agricultural development from the colonial era to the post-colonial periods of 1960's and 1970's. The book raises many issues on emergence of inequalities generally by our development strategy which with very little regard to medium/marginal areas. However, the National Development Plan 1974-78 recognised the importance of these marginal areas by stating:

"---- allocation of funds within agriculture, greater attention will be paid to the less developed agricultural areas and to the range areas than has been the case before."³³

Thus while general development aims at improving income distribution by concentrating attention on the rural areas; concentrating on the poorer areas within the rural sector is a part of the agricultural policy in this respect.

32. W.M. Senga (1976) - Kenya's Agricultural Sector.-

33. Republic of Kenya - National Development Plan 1974/78 Government Printer.

On industrial development, Heyer recommends that it would be helpful if industrial sector in the Country (Kenya) were able to take agricultural products to more final stages of processing.³⁴ He admits that the prevailing situation of processing is typical of developing countries which are at the early stages of industrialisation.

On the employment situation in Kenya, Heyer says:

"employment outside agriculture has not grown nearly as fast as output"³⁵

He sees agriculture as being over burdened as the main employer of rural population surplus. Industries can generate employment and incomes that can alternatively stimulate greater productivity and bigger domestic markets. From this evidence, it is clear that establishment of manufacturing industries using large amounts of labour, in developing countries like Kenya, hopefully would correct disguised rural unemployment within their primary production activities.

Needless to say, it is not surprising that developing countries see rapid industrialisation

34. Heyer (1976) Op. cit. pp. 2

35. Ibid, pp. 6.

as a cure to their socio-economic ills of unemployment. A survey conducted in 1977 in seventy countries indicated that in most of these countries, the majority of the population believes that greater industrialisation is essential for improving the quality of their lives. Kenya is no different in this respect. It is truism that industrialisation can reduce the unemployment problem. To this end, Kenya National Development Plan, 1979-83 states that in the future rapid expansion in the manufacturing sector;

"will play a major role in expanding incomes and in the alleviation of poverty", for urban and rural dwellers.³⁶

According to Power (1971)³⁷:

"Industrialisation is an essential aspect of economic development for Kenya as well as for virtually all other less developed countries. For Kenya in particular, with its catastrophic rate of population growth and reasonable expectation that it will take many years, it is critically important sectors where the principal resources complementary to labour are most

36. National Development Plan, 1979-83 pp. 325.

37. J.H. Power (1971) - The role of protection in industrialization policy cited in perspectives on Future Economic Prospects and Problems in Africa, I.D.S. Discussion Paper No. 121, University of Nairobi.

easily augmentable should begin to absorb a rapidly rising proportion of raw entrants to the labourforce."

This contention by power emphasizes the fact that, industries have a vital role to play in reducing unemployment problem particularly in less developed countries with high population growth rate, these industries will create employment opportunities for rural people especially the school leavers and those underemployed in agricultural sector.

Chuta and Liedholm commends the Sierra Leone's new industrial strategy which was fully articulated in the National Development Plan, 1974. The strategy implied that priority would be given to the following types of industries:

1. agro-industries and others based on natural resources.
2. labour-intensive industries; and
3. industries which aid expansion of exports and development of traditional agricultural sector.³⁸

38. E. Chuta et. al - The role of Small Scale Industry in Employment Generation and Rural Development: Initial Research Results from Sierra Leone, Michigan University.

The National Development Plan (Sierra Leone) noted that the Small Scale industries particularly those located in the rural areas will contribute to employment generation and relief of urban unemployment and rural underemployment since the sector is labour intensive.

Chuta concludes that African Governments have recently become aware of and concerned with rural industrialization by recognising that industries are not just urban phenomenon but are component of rural development programmes as well.

Needless to say, rural industrialisation is the development of an industrial sector besides the agricultural sector and other monetized economies within rural areas of the country. Undoubtedly, the benefit of rural industrialisation is to improve rural economies; provide employment for rural population and raise the general living standards in the rural areas.

Kenya is an agricultural country and it will remain so because it has no commercial minerals. Much of the contribution to the growth of the Gross

Domestic Product has been from agricultural sector. Because of this the Government has realised the need for eventual industrialization through increased productivity in agriculture. Establishment of agro-based industries will form a significant basis for industrial development; that is, manufacturing which will involve agricultural processing both for external and local markets. The industries will provide employment opportunities in addition to providing goods and services which are needed in the rural areas.

According to UNIDO Report, the industries to be fostered, encouraged or promoted are those which are functional, that is serve an economic and social purpose. To be able to know these industries, one needs an appreciation of the economic milieu within which these industries have to be planted and operated as well as the feel of the problems which they are to help in solving.

Further, the report concludes that the current trend of industrialization call for a fresh approach; and it lays down three sets of factors which would determine whether an industrial strategy is suitable:

39. United Nations Industrial Organization, Newsletter.

1. Development Goals, like growth of employment and output through more effective use of local resources formation of skills, reduction of inequalities, income distribution, fulfilment of basic needs of the people, improvement of the quality of life and promotion of self-reliance.
2. Resource endowment like availability and cost of local manpower, level of skills, domestic savings, local management capability and cost of water, energy and natural resources; and
3. Conditions of application like level of infrastructure; climate environment and tradition.³⁹

The report says that there is evident dissatisfaction in many quarters with the prevailing pattern of industrial growth based mainly on large and medium scale industries which have failed in most cases to make significant impact on employment, income distribution regional disparity and other pressing social problems. Thus these industries are not functional but rather permissive in nature.

Nonetheless, the industrial location theory is worth discussing at this juncture. Renner (1947) when

³⁹United Nations Industrial Organization, Newsletter.

discussing industrial location states that an industry tends to locate at a point which provides optimum access to its ingredients or component elements.⁴⁰ Agricultural processing involve bulky inputs, weight loss and in the case of food industries perishable raw materials. The location of processing enterprises is - significantly influenced by the supply of raw materials. Thus these industries are raw-material orientated.

Norcliffe (1975) has argued further that in so far as that they are raw material orientated, the location of processing activities will correspond with the fortuitous location of the materials that are processed.⁴¹ These arguments hold true in respect with location of tea factories, timber industries, and so on; because of the perishability and bulkiness of the raw materials involved. Though most of food processing industries have tended to become increasingly footloose, industries related to mineral extraction and agricultural processing still tend to locate in the regions of raw material extraction.

40. G.T. Renner "Geography of Industrial Location 1947" cited in D. Smith Industrial Location. An Economic Geographical Analysis, New York 1971.

41 G.B. Norcliffe: "A theory of Manufacturing Places" in Walker and Collins (eds.) Locational Dynamics of Manufacturing Activity, 1975.

Ross and Hall (1896) in discussing the location of industry examined only rational and economic elements ; that is, cost factors, raw materials, labour and market as the ones behind the decision to locate industries.⁴² The location of agricultural processing industries will overwhelmingly be influenced by the availability of raw materials. The fact that the industries are raw material orientated makes it feasible for them to be located in the rural areas where they provide goods to the people in addition to creating employment opportunities and raising rural incomes.

Conversely, the agriculture and mineral based industries in regions of underdeveloped countries are mainly producing for export and their contribution to the regional economy according to Gilmour (1975) Can be explained by export-base theory.⁴³ According to this view, development will depend on the production function of the export industry and the distribution of income from the export sector, as these will determine the opportunities for investment in non-export activities and in infrastructure. Gilmour sees mechanisms which connect the export sector to investment in infrastructure and directly productive activities as backward and forward linkages.

42. A.E. Ross et. al. - Location of Industries; Q.I.E. 1896.

43. J.M. Gilmour "The Dynamics of Spatial Change in the export Region, in Collins and Walker (eds) op. cit.

Hirschman (1958)⁴⁴ describes backward linkages input provision derived demand and forward linkages as output utilization activities, namely that every activity that does not exclusively cater for final demands will induce attempts to utilize its outputs as inputs in some new activities.

He argues that development policy must attempt to enlist these well known backward and forward effects, but it can only do so if there is some knowledge as to how different economic activities "score" with respect to these effects.

Darkoh (1975)⁴⁵ contends that each project using local raw materials contributes significantly to the rest of the growing industrial and rural hinterland. It therefore requires a careful planning of proposed linkages based on detailed analysis of resources available, labour, skills, markets and investments. Thus identified industrial location strategies should ensure that inter-regional and intersectoral linkages are intensified in the national economy.

44. A.O. Hirschman - The Strategy of Economic, 1958-
Yale University Press.

46. M.B.K. Darkoh, "Toward a planned Industrial Reallocation Pattern in Ghana" in Urbanization, National Development and Regional Planning in Africa, by Obudho (eds.)

Two important interpretations have been given as regards the location of industries in the rural areas; (1) rural industrialization as a process of decentralization of urban industry; and (2) rural industrialization as a part of the wider strategy of balanced growth.⁴⁶

In Kenya, growth centre and service centre strategies are aimed at reducing regional imbalances and stimulate rural development by absorbing surplus labourforce from agriculture. From this, it clear that the whole concept of Growth Centre is tied to rural industrialization strategy. It advocates that investments (industrial, commercial etc.) should be directed to these selected service centres with a view to spreading growth and development hence creating balanced growth.

The propositions advanced by different scholars of rural development indicate that the whole idea of rural development revolve around the issues of raising the standards of living of the rural population, that is, alleviating poverty and meeting everybody's basic needs. From this it is very clear that agriculture and industry have a vital role to play in

46. B. Mikkelson, "Interpretation of Rural Industia-
lisation in Kenya" in Dualism and Rural Development
in East Africa, by Leys (ed) IDR, 1973.

the process of rural development in terms of providing employment opportunities and raised rural farm incomes. In fact for a country like Kenya where 85% of her population reside in the rural areas practising agriculture, it would be wrong to assume that rural development can be effective without agriculture. Agriculture is the backbone of Kenya economy and any other sector has to rely on it for growth and sustenance.

Andreou (1977)⁴⁷ reiterates that rural development must effectively improve the economic viability of agriculture as well as stop the flow of young school leavers to the cities.

According to Obwa (1977)⁴⁸ the aim of rural development should be to eliminate poverty by increasing agricultural production, incomes and employment opportunities. From this it is openly clear that agriculture is very vital in the process of rural development.

However, with all this emphasis on agriculture one wonders what is happening in the areas of the world where land is scarce due to high population growth.

47. P. Andreou (1977) op. cit.

48. Oiro Obwa (1977) op. cit.

In such regions of the world there is an ever increasing pressure on land, hence unemployment and underemployment in agriculture.

Asiz (1978)⁴⁹ indicates clearly that with limited land resources it is very likely that the land will not provide a continuous employment without any off-farm activities. Meru is a region experiencing high population pressure on land, particularly in the high potential areas. Hence off-farm employment opportunities are necessary in the district.

This study has adopted what Power (1971), Michoma (1980), Karani, (1976) and others found out that, industries have a significant role to play in the process of rural development in terms of providing employment opportunities and rural incomes. Power (1971) reiterates that industries have a vital role to play in reducing unemployment problem particularly in the LDC's with high population growth rate. These industries will create employment opportunities for rural people particularly, the school leavers and those under-employed in agriculture.⁵⁰ The importance of industrial sector in the process of rural development cannot be overemphasized.

49. S. Asiz (1978) op. cit.

50. Power (1971) op. cit.

Uma Lele (1975) underscores the importance of industries as they play a vital role in employment creation. This study concurs with her contention that, "industries -- can absorb rural exodus".⁵¹ Infact the industries particularly the recourse-based which normally tend to locate at the source of raw materials act as dumping workplace for surplus labourforce unemployed and underemployed in agriculture.

Nevertheless, the next question to ask is; which are the most feasible and viable industries which will boost rural development in terms of providing employment and raised incomes in Meru? This study concurs with Chuta's arguments that rural industrialisation policy should give priority to the following types of industries:

- (a) agricultural processing industries and others based on the natural resources.
- (b) labour-intensive industries; and industries aid expansion of export and development of traditional agricultural sector.⁵²

Meru is exclusively agriculture and it will remain so because it has no commercial minerals. This means

51. Uma Lele (1975) op. cit.

52. Chuta et. al. op. cit.

that agricultural processing industries will be the most viable basis for industrialization. Establishment of the agricultural processing plants will form a significant basis for industrial development. Thus the manufacturing that will involve agricultural processing will provide employment, in addition to providing goods and services for external and domestic markets.

Meru has a high agricultural potential; and this potential may be exploited in order to boost rural development. Much of the contribution to the growth of the G.D.P. has been from agriculture (Kenya). Hence the Government has realized the need for eventual industrialization through increased productivity in agriculture.

With this view in mind, this study set out to assess and examine the agricultural resources which have the scope for development of agricultural processing industries in order to provide employment opportunities, raise rural farm incomes and provide basic infrastructure. The study concurs with contentions by power (1971) Michoma (1980); Karani (1976) and others; that industries have a vital role to play in the process of rural development by providing employment opportunities and incomes.

According to industrial location theorists (Renner, G.T. 1947; Norcliffe, 1975; Ross, 1896; Gilmour; etc.) industries tend to locate at a point which provides optimum access to its ingredients or component elements. Agricultural processing involve bulky inputs, weight loss and in the case of food industries, perishable raw materials. Needless to say, the location of processing will correspond with location of raw materials that are processed. The fact that the industries are raw material oriented makes it feasible for them to be located in the rural areas where they provide employment opportunities to the rural population.

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CHAPTER TWO

BACKGROUND TO THE STUDY AREA AND THE DEVELOPMENT SITUATION IN MERU DISTRICT

2.0 INTRODUCTION

This chapter introduces the district which is the study area. Apart from providing background information, the presentation in this chapter is on those aspects that give us general understanding and appreciation of factors that have an effect on the development of the district. Thus the chapter discusses: physical, social and economic characteristics of Meru district.

2.1 LOCATION AND SIZE

Meru district is situated in Eastern Province of Kenya. It is located between latitude $1^{\circ}31'$ South and $0^{\circ}35'$ North; longitude $37^{\circ}5'$ East and $30^{\circ}21'$ East. The district covers an area of 9922 square kilometres (992200 hectares). It borders Isiolo District to the North and East, Embu and Kitui districts to the South and Laikipia district to the West (Map. No. 1). The district is approximately 300 kilometres North East of Nairobi.

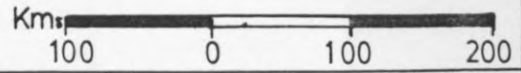
Administratively, the district is divided into seven divisions, namely: North and South Imenti, Nitti, Timau, Tigania, Igembe and Tharaka; 38 locations and



MERU DISTT: National Context.

- - - International boundary
- - - Provincial boundary
- ▨ MERU DISTRICT (study area)

Map no.1



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137 sublocations, Plus Southern Grazing Area and the Meru National Park.

The district has two recognised local authorities, Meru County Council and the Municipal Council of Meru.

The district is the home of homogenous group of people called the "Wameru" and had a population of 830,179 people in 1979. The Meru people live on the opposite side of Mt. Kenya from the Kikuyu.

2.2 PHYSICAL FACTORS

2.2.1 TOPOGRAPHY AND GEOLOGY

Meru district ranges in elevation from about 300 metres to over 5380 metres above sea level. The two huge masses, Mt. Kenya and Nyambene Range are the dominating physical features of the district. They provide striking relief and affect every other aspect of physical landscape in one way or another. Mt. Kenya is in the west and Nyambene Hills in the North Eastern part of the district.

From its greatest Western Zenith at 5380 metres above sea level, the vast Mt. Kenya dome slopes gently northward and eastward blending into the East Plateau

of Kenya. Although the gradient of the mountain is gradual, the larger streams have carved deep incisions in its igneous bedrock particularly to the south.

The Nyambene Range of hills is an elongated, extruded volcanic feature which rises sharply above the surrounding plateau to a height of 2500 metres.

The dominance of these two mountain masses has great effect on the agricultural practises in the district. This is in terms of soils and rainfall distribution and reliability. To the North of the District, are lava plains composed of volcanic Nyambene Lava low lying and of particularly shallow and rocky soils. These plains gently descend northwards to 850 metres. The unevenness of the surface in the south is broken by volcanic cones, and in the north by non-volcanic inliers of the basement complex.

The Eastern and South-Eastern parts of the district, lowlands stretch from the lower slopes and beyond Mt. Kenya's volcanic materials yield to pre-cambrian basement which descends gently to the Tana River and leaves Meru at an attitude of 300 metres above sea level.

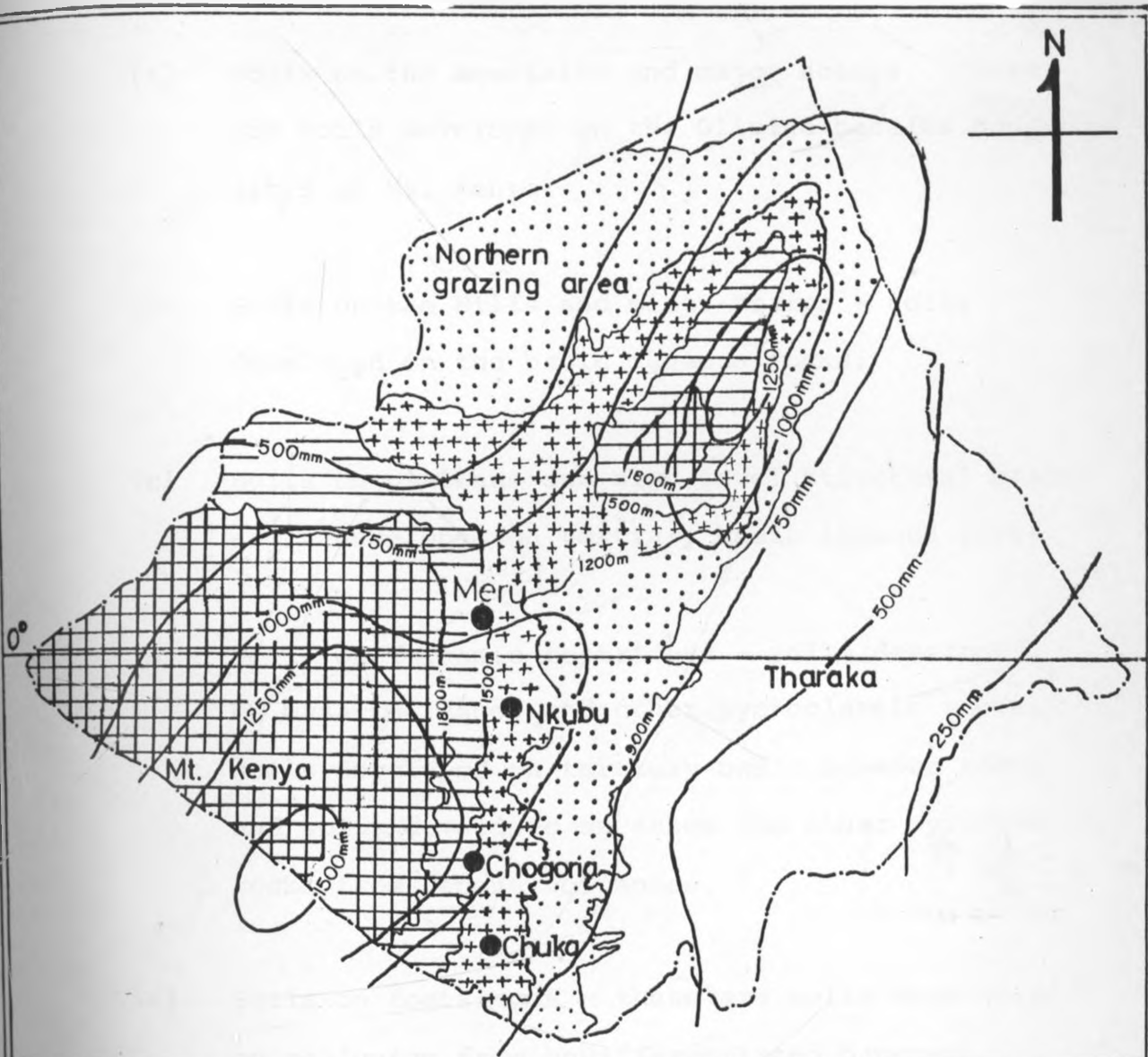
The whole of Eastern part of Meru district is rocky, surface roughened by steep inselbergs and characterised by adrainage system in its maturity age. (Map. No. 3).

2.2.2 SOILS

The prevailing types of soils in Meru district are a result of volcanic activity. This phenomenon led to the formation of the two dominant mountain masses (Mt. Kenya and Nyambene Hills) both of which are of volcanic origin.

Mt. Kenya and its foothills determine the physiography of the upper part of Meru District. The mountain of olivine basalts and ashes occupy the south west and the centre of the district followed by foothills. The northern and north western boundary is taken up by plateau of tertiary basic igneous rocks. Non-dissected erosional plains of the same parent rock occur in the north. In the eastern region, dissected and non-dissected erosional plains are dominant as well as bottom lands.

The major types of soils and how they are developed:



MERU DIST: PHYSICAL FACTORS

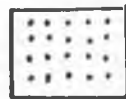
0 10 20 30 KILOMETRES

map 3

LEGEND



Above 1800 Metres



900-1200 Metres



1500-1800 "



Below 900 "



1200-1500 "



Isohyets

- (a) Soils on the mountains and major scarps. These are soils developed on the Olivine basalts and ashes of Mt. Kenya:
- (b) Soils on the Hills and minor scarps - soils developed on the basic igneous rocks;
- (c) Soils on plateaus and high level structural plains soils developed on tertiary basic igneous rocks.
- (d) Soils on volcanic footridges - soils developed on basalts, ashes and other pycroclastic rocks, soils developed on tertiary basic igneous rocks and soils developed on ashes and other pyroclastic rocks from recent volcanoes.
- (e) Soils on footslopes - these are soils developed on colluvium from undifferentiated basement system rocks;
- (f) Soils on lower middle-level uplands - these are mainly soils developed on intermediate igneous rocks and those developed on undifferentiated basement system rocks;

- (g) Soils on non-dissected erosional plains - These are developed on basic igneous rocks; and also soils developed on crystalline or sedimentary limestones;
- (h) Soils on bottomlands. These are soils developed on infill from undifferentiated volcanic rocks and also soils developed on infill from limestones; and
- (i) Soils on Flood Plains. These mainly are soils developed on sediments specially from Olivine basalts.⁵³

The chemical composition of the soils in Meru District with respect to plant production is relatively very good thus the district is classified as high potential, although not the whole district.

2.2.3 DRAINAGE

The drainage of Meru district flows into Tana River. The rivers and streams flow from west to East. The drainage pattern is essentially determined by three major factors.

53. Helmut Schmidt - Farm Management Handbook of Kenya Vol. II - Natural Conditions and Farm Management Vol. II/C East Kenya, Ministry of Agriculture and Germany Agricultural Team page. 99-102.

- (i) the northern slopes of Mt. Kenya.
- (ii) the north-eastern to the south western watershed in the Nyambene Range; and
- (iii) the structure in the basement system.

The streams and rivers from the eastern slopes of Mt. Kenya flow towards the Tana River, which also receives all the drainage from the southern flanks of Nyambene Range. The major rivers from Mt. Kenya flowing towards the Tana River include: Thuchi, Kathita, Nithi, Thingithu, Mutongah and Ruguti Rivers; while those from Nyambene range include Thanantu, Ura and Thangatha. Some of these rivers and streams have incised deep forges downstreams.

2.2.4 CLIMATE

The topography of Meru has a critical influence on climate and consequently on agricultural potential. The high land masses lessen the effect of high temperatures and rate of evaporation and cause them to loose a greater amount of moisture than over low lying areas.

(a) RAINFALL

Stations on the south and south east slopes of Mt. Kenya can be expected to receive between 1250 and 2250 millimetres of rainfall annually; the eastern and northern lowlands receive less amounts within the range of 379-1000 millimetres. In examining rainfall distribution in the district, two important features are notable.

One is the strikingly sharp rainshadow north of Mt. Kenya and North west of the Nyambene Range. This phenomenon dramatically alters the agricultural potential of these areas.

The second feature is the pronounced decline in the amount of rainfall as one moves towards the eastern side of the district places like Tharaka. The moist parts of the eastern lowlands receive 750-1000 millimetres of rainfall on an average; the drier further to the eastern and the south eastern parts of the district receive 500 millimetres or less. However most of the district is within 20% rainfall probability zone with over 500 millimetres of rain a year. The drier Northern and Eastern areas have a probability of less than 10% with less than 500 millimetres of rainfall a year.

TABLE 6: RAINFALL FIGURES FROM VARIOUS STATIONS IN MERU DISTRICT (having atleast 10 years of records upto 1976)

Name of Station	Altitude (M)	Years of records	Annual Rainfall (MM)
Timau Marania	2,499 M	43	884 mm
Miatheni	1,433	27	1,624
Oringo Seed farm	1,430	28	1,300
Muthara	1,478	20	1,164
Timau, Arden Caple	2,286	19	698
Meru Forest Station	1,585	24	1,403
Lare	1,775	10	2,640
Meru Agr. Dept.	1,555	14	1,602
Mikinduri Catholic	1,405	22	2,221
Muchii Mukuru	1,905	26	2,525
Mujwa Catholic	1,158	47	1,479
Chuka	1,494	30	1,500
Magutini	1,158	17	1,323
Nkubu secondary	1,527	23	1,765
Mitunguu	1,189	19	1,401
Nkuriga	1,829	18	1,859
Marimba Centre	1,844	26	2,208
Chogoria Forest	1,372	18	1,979
Mariene Coffee	1,524	18	1,914
Marimanti	610	12	879
Tharaka Chiefs	914	23	787

Source: Helmut Schdint - Farm Management Hand book of Kenya Vol. II/C, prepared by Min. of Agriculture in conjunction with Germany Agricultural Team - pp. 81.

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The combination of both temperatures and the low rainfall has produced a very marginal and semi-arid land not suitable for agriculture in the district. The average annual rainfall records are available from several rainfall stations (Table No. 6).

Meru district has two main rainy seasons in March, April and May, and short rains in October, November and December. The dry spell in Meru fall in January and February and June, July and August.

(b) TEMPERATURES:

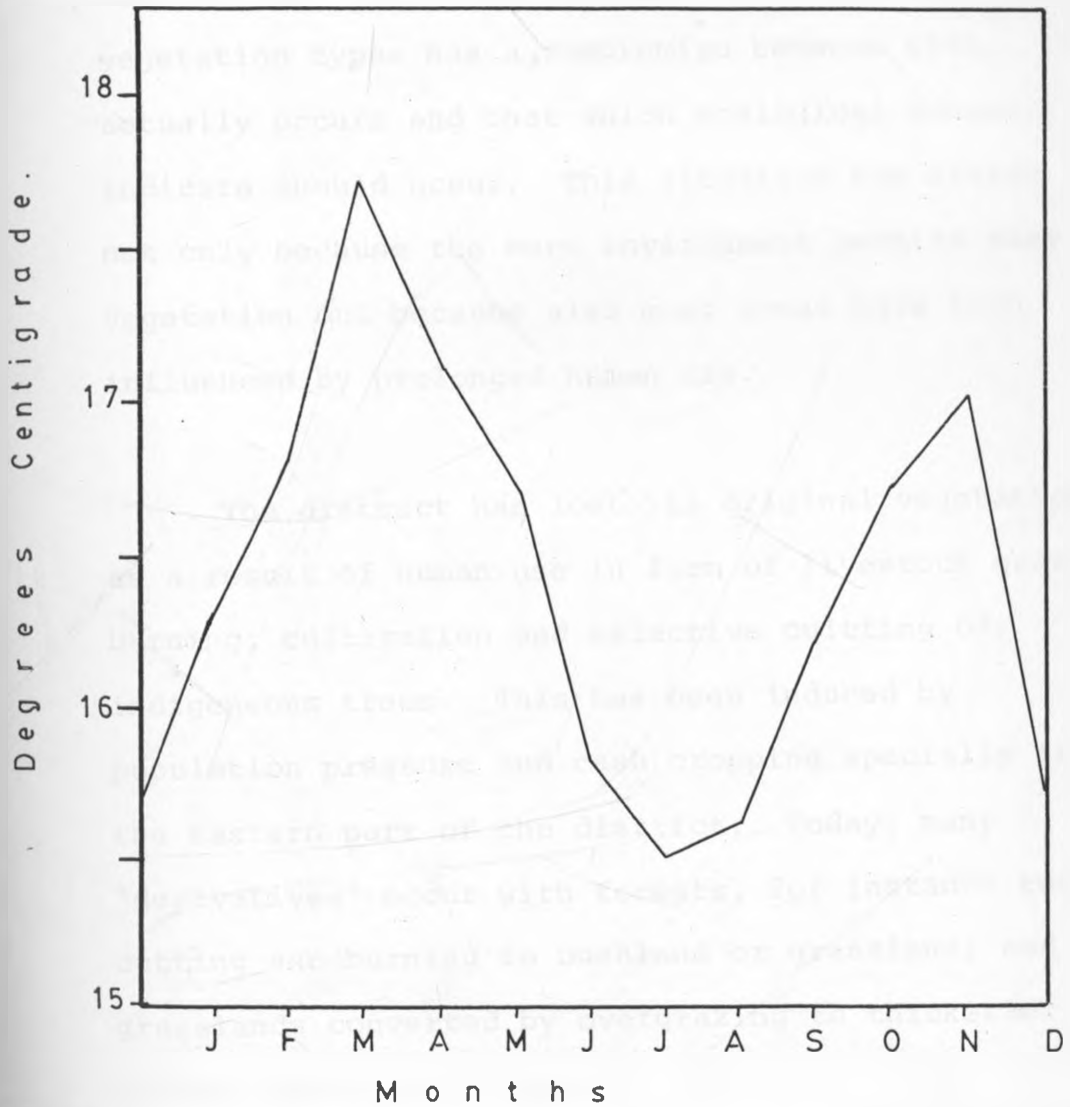
The climate ranges from temperate with a 20^oc mean temperature in the higher altitude areas around Mt. Kenya to tropical with around annual mean temperature of around 33^oc in the low and dry areas around Tharaka Mikinduri, Kianjai, Meru National Park and the Northern Grazing area. The figures shown below are for middle altitude.

TABLE 7:

TEMPERATURE DATA FOR TWO STATIONS IN MERU

STATION	ALTITUDE (METRES)	YEARS OF RECORD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	MEAN
Meru Forest Station	1,765 m	5	16.3	16.8	17.1	17.1	16.7	15.8	15.5	16.6	16.2	16.7	17.0	15.7	16.4
Mariene Coffee Research	1,524 m	10	17.6	18.1	18.4	17.8	16.9	15.8	15.3	15.7	17.1	18.8	17.5	17.1	17.1

Source: Farm Management Handbook of Kenya - Vol. II Part C page. 82.



MERU DISTRICT: Mean Annual Temperature.

SOURCE: MARIENE COFFEE RESEARCH STATION

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FIG no 2

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2.2.5 VEGETATION AND ECOLOGY:

The major natural vegetation in Meru District are forests, derived grasslands and bushlands. The vegetation types has a compromise between that actually occurs and that which ecological concepts indicate should occur. This situation has arisen not only because the Meru environment permits many vegetation but because also most areas have been influenced by prolonged human use.

The district has lost its original vegetation as a result of human use in form of livestock grazing, burning, cultivation and selective culttting of; indigeneous trees. This has been induced by population pressure and cash cropping specially in the Eastern part of the district. Today, many "derivatives" occur with forests, for instance reduced cutting and burning to bushland or grassland; and grasslands converted by overgrazing to thicket or barren land.

Mt. Kenya forest (Imenti) in the western part of the district indicates that the original vegetative cover was a moist montane forest. This has now been replaced by moist montane shrub grassland and cultivation savannah.

Ecologically, most of the district lies in the forest-derived grasslands - bushlands zone which are zones of high and medium potentials with adequate rainfall good deep soils and moderate temperatures. The potential is for forestry with local wildlife and tourist development (Mt. Kenya) or intensive agriculture including pyrethrum, coffee, tea, maize and exotic cattle. The three belts offer excellent opportunities for the district to develop a diversified form of agricultural production based on the potentialities of each zone.

2.3 SOCIO-ECONOMIC SITUATION

2.3.1 DEMOGRAPHIC CHARACTERISTICS

(a) POPULATION

The population of Meru district at the time of the census in September 1979 was 830,179 people. The district had 150,662 households with approximately 5.50 persons per household.⁵⁴ The population growth rate is as high as 3.3%. The 1969 population census revealed a total of 596,506 people; thus the 1979 census revealed an increase of 233,673 persons (39.2%) bringing the population for that year to 830,179 people.⁵⁵

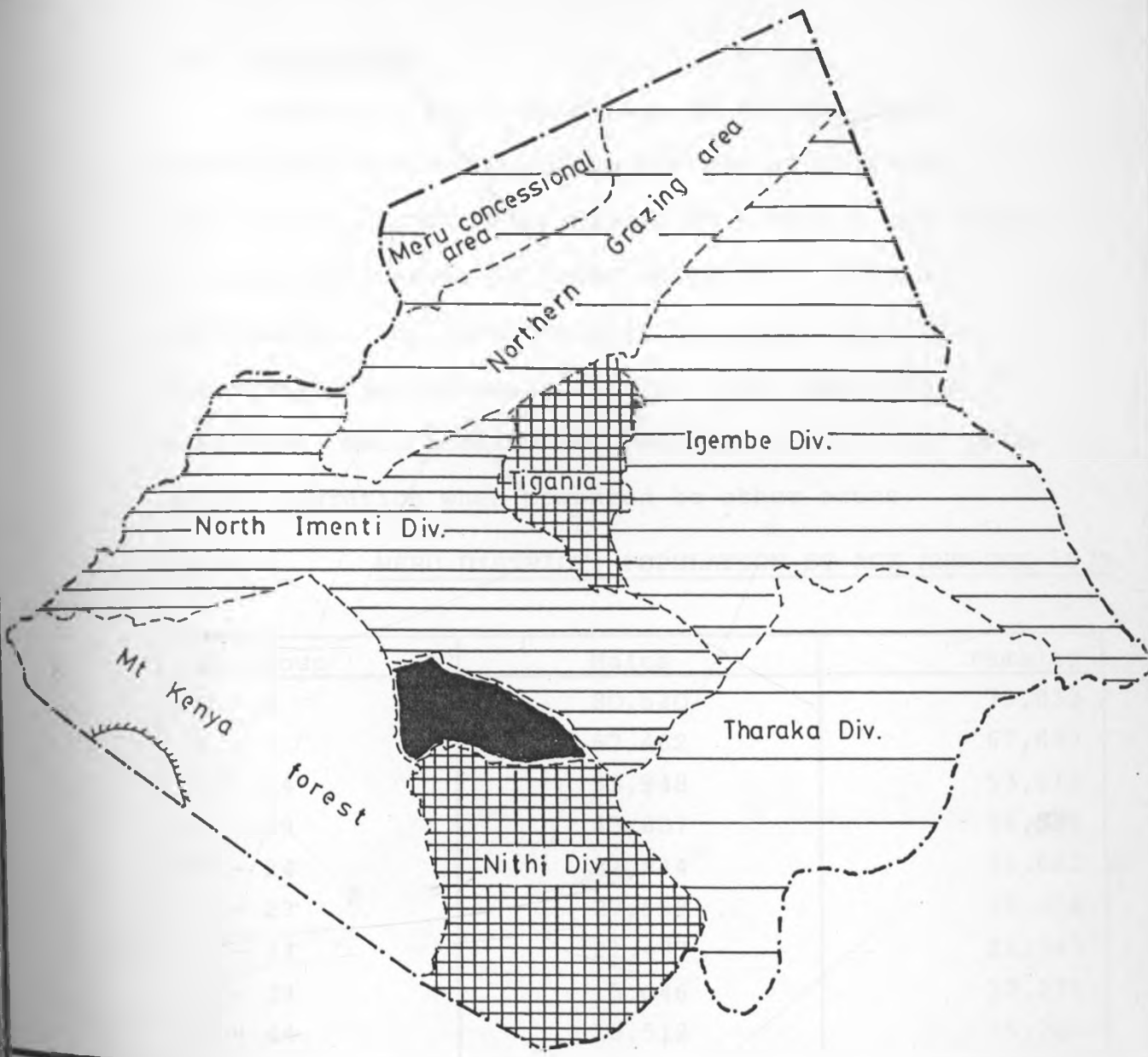
54. Central Bureau of Statistics (CBS)

55. 1969 and 1979 Kenya Population Censuses.

In 1969 the population density was 63 persons per square kilometre as opposed to 83 persons per square kilometre in 1979. However, if we exclude the forest, National Grazing area and the National Park population in Meru district in habits only 6530 square kilometres of the (9922 square kilometres) total area. This gives a density of population of 91 persons per square kilometre for 1969 and 126 persons per square kilometres in 1979.

South Imenti Division which had the highest population density of 215 people per sq. kilometre in 1969 continued with the same trend into 1979, where it had a density of 263 people per square kilometre followed by Nithi division which had a density of 22 persons per square kilometres; and thirdly, the Tigania division with 215 persons per square kilometre in 1979. The lowest density was experienced in Tharaka division which had 33 persons per square kilometre in the 1979 population census.

Considering the density of population and the pressure on the relatively scarce land, one would assume that the district has relatively high outflow of persons. The high population pressure on land is a crucial factor in Meru District Planning. (Map No. 4).

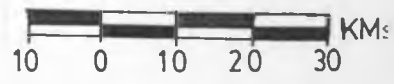


MERU DISTRICT : Population Density 1979(CENSUS)

Legend

--- DISTRICT BOUNDARY
 - - - DIVISIONAL "

NOTE:
 no area under category 151-200.



	0 persons /KM ²		101-150	"
	< 50 "		201-250	"
	51-100		251-350	"

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MA P no 4

(b) MIGRATION

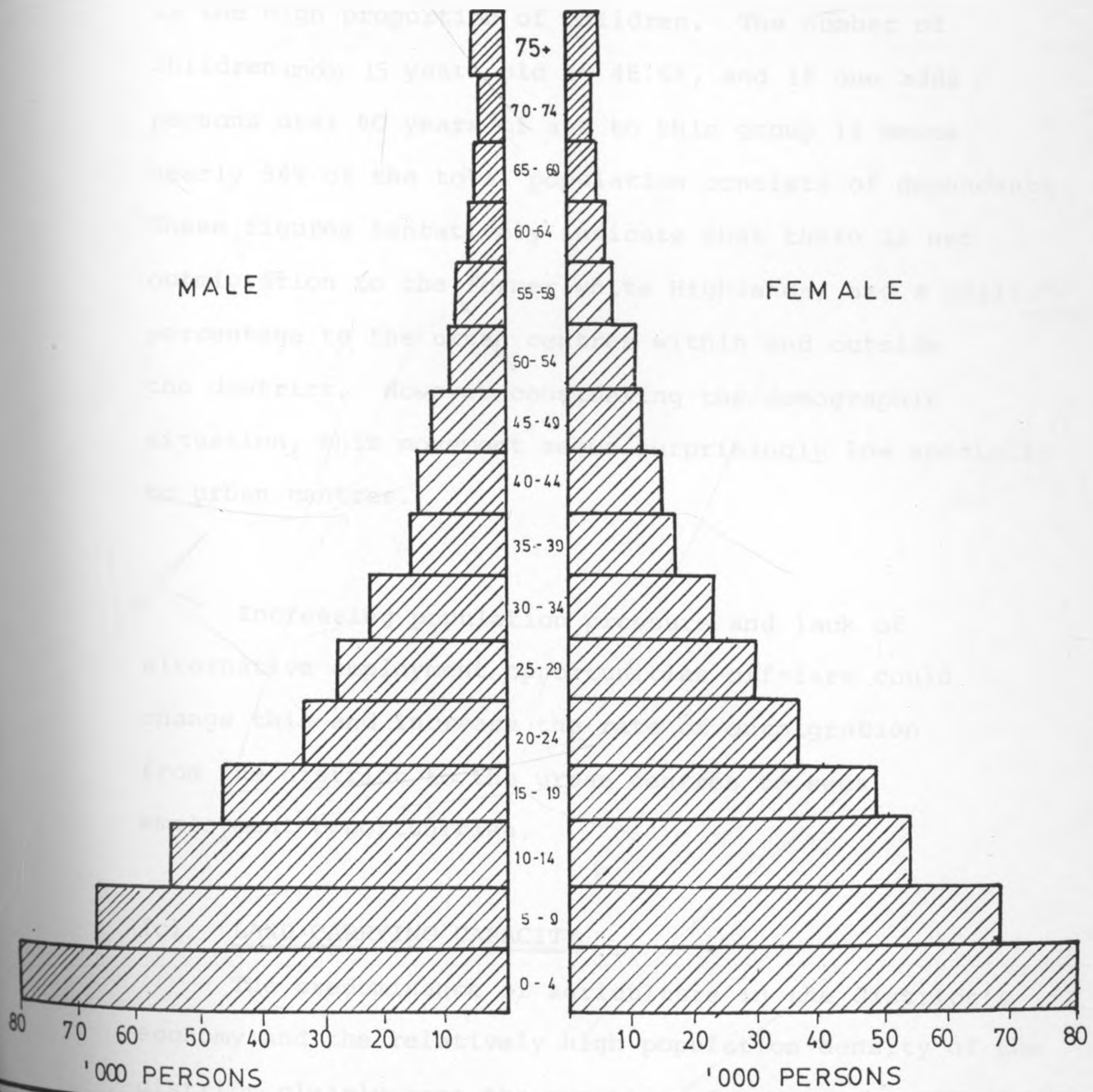
There is little migration in the district. About 2.8% of the population migrate as compared more to the former White Highlands - Timau; and others to settlement areas in Lower Abothuguchi, Nkuene and Tharaka. Of the Meru migrants 84.3% move to the former settled areas and 15.7% to urban areas.⁵⁶ Basically, Meru people have remained on the land with little migration when compared to other areas.

TABLE 8 MERU DISTRICT: POPULATION BY AGE AND SEX 1979

Age Group	Males	Females
0 - 4	80,520	79,853
5 - 9	67,462	67,647
10 - 14	53,948	53,612
15 - 19	45,807	48,573
20 - 24	32,844	36,667
25 - 29	27,558	29,803
30 - 34	21,477	22,543
35 - 39	15,046	17,271
40 - 44	13,512	15,285
45 - 49	11,680	12,158
50 - 54	9,474	10,459
55 - 59	8,122	7,418
60 - 64	6,061	6,198
65 - 69	5,250	4,476
70 - 74	3,601	3,433
75+	5,256	5,212
Total	408,596	421,583

Source: 1979 Kenya Population Census.

⁵⁶. Meru, District Development Plan, 1979-83.



KERICHO DISTRICT : population pyramid 1979.

6 no 1

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A notable feature of age- sex structure in the district is the high proportion of children. The number of children under 15 years old is 48.6%, and if one adds persons over 60 years of age to this group it means nearly 54% of the total population consists of dependants. These figures tentatively indicate that there is net outmigration to the former white Highlands, and a small percentage to the urban centres within and outside the district. However considering the demographic situation, this movement seems surprisingly low specially to urban centres.

Increasing population pressure and lack of alternative employment opportunities off-farm could change this and increase the rate of outmigration from the district to the urban centres to seek employment opportunities.

(c) LAND CARRYING CAPACITY

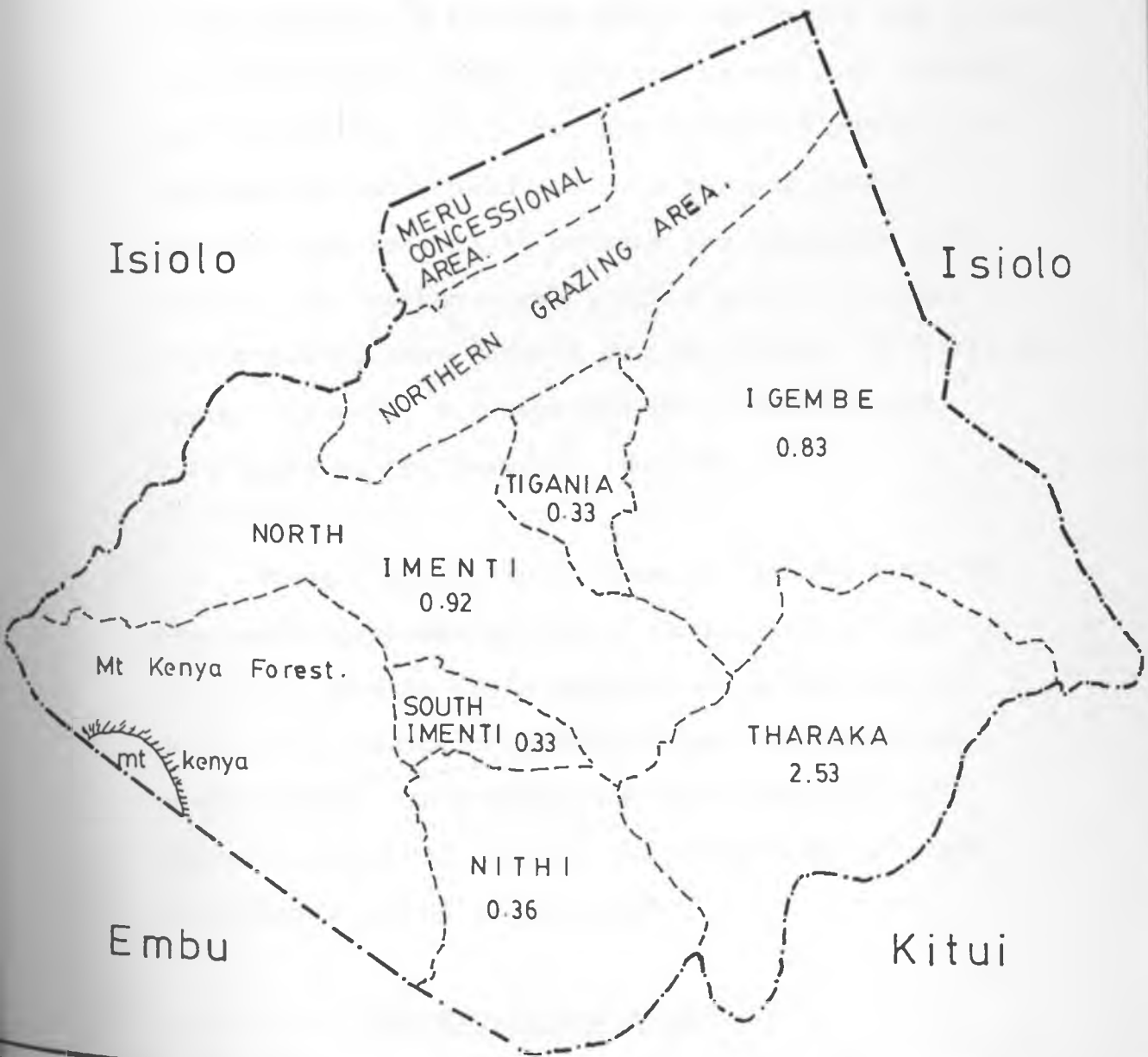
The predominance of agriculture in the district's economy and the relatively high population density of the district clearly pose the question of how many people the district can hold at a certain standard with minimal strain on the resources. The carrying capacity indicates for how many persons the potential of a given

area could provide livelihood under various assumptions.

The decision on what can be termed as the carrying capacity of a particular area depends on what is defined as the minimum living standards and the productivity of an area. The productivity of an area will depend partly on the technology and the number of persons living on a particular piece of plot. The higher the number of persons living on a piece of plot, the lower the production (yield).

The total rural area in Meru district is 664,600 hectares, where only 532,200 hectares is agricultural land and 112400 hectares non-agricultural land. The average area per household in the district (1979) was 3.97 hectares, and 0.71 ha per person. These figures varied from one division of the district to the other.

South Imenti division which is one of the most populous division had 1.80 hectares per household, giving an average of 0.32 ha per person. The area per person is relatively low when compared to 0.71 ha. per person (District figure) the situation in this division is pathetic.

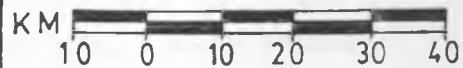


MERU DISTT: Average Land Holding by Divisions (Ha/person)

legend

--- District boundary.

- - - Divisional "



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M A Pno 5

In North Imenti the land area available to a household was 5.1 hectares where one person had a share of 0.92 hectares; Nithi division it was 2.07 hectares per household and 0.36 ha. per person; Tigania, 1.78 hectares per household and 0.33 ha. per person; Tharaka division, 13,46 persons per household and 2.53 ha. per person (land in this area is of very low productivity, hence people own very large chunks); and Igembe division, 4.7 hectares per household and 0.83 hectares per person⁵⁷ Map. No. 5.

These figures are informative on the trend of population pressure on land. Consequently, this is likely to lead to low standards of living due to decline in production per unit area and disguised unemployment. This must be stepped down at all possible costs, if at all, the objectives of rural development are to be achieved.

2.3.2. (a) AGRO-ECOLOGICAL ZONES

Meru can be divided into seven broad agro-ecological zones. The agricultural zones conform with variations in soils, climate and altitude. Each zones

57. Farm Management Handbook of Kenya, Vol. II/C op. cit. page 105-106.

specializes in different combination of crops. On this criteria, the agricultural zones can be differentiated. The district has 532,200 hectares of agricultural land broken down as shown below. (Table 9)

TABLE 9: MERU: AGRO-ECOLOGICAL ZONES

CATEGORY	AGRO-ECOLOGICAL ZONE	AREA(HA)
High potential	Zone I and II	155,000
Medium potential	Zone III	250,000
Marginal Areas	Margial area Zone IV and V	124,800
Range Land	VI and VII	67,200
Irrigated area	-	189

Source: Meru District Development Plan, 1984-88, Government Printer pp. 4.

High potential areas have good soils and adequate rainfall. These areas receive between 1250 and 2250 millimetres of rainfall annually; as opposed to medium/marginal areas which receive less than 1000 millimetres of rain annually. Temperaturewise, these areas have a mean temperature of 20^oc.

Soils in these areas are of volcanic origins. They are soils developed on basalts, ashes and other igneous rocks. The main crops grown in this area are coffee, tea, maize, pyrethrum and potatoes; whereas, sunflower, tobacco, sorghum/millet, cotton are found in medium and/or marginal zones of the district. All cash crops grown in the area are to be found either in high and/or medium potential zones.

In high potential agro-ecological zones there is intensive farming practices going on. Dairy animals do well in these areas while the rest of the zones support indigenous cattle. Majority of the ranches are found in the Northern Grazing area.

The major natural vegetation in Meru are forests, derived grasslands and bushlands. Initially the high potential areas were covered with natural forests, but due to population increase there was clearance of forests to give way to agriculture. Today, the areas which were forests are covered with derived grasslands and bushes.

More than half of the district's population is to be found in high and medium potential areas of south and north Imenti, Nithi and Igembe divisions. Tharaka

has the lowest population density in the district. In 1979 it had 33 persons per square kilometre. From this, it is clear that the high potential zone is experiencing a serious population pressure on land. Consequently, unemployment problem is inevitable. There is need for an alternative employment opportunities in the district which in the long-run will absorb surplus population from agriculture.

The population density of certain locations is a stoundingly high. In 1979, Ntima location of north Imenti had 615 persons per square kilometre; and on average the populaton density in high potential areas was 235 persons per square kilometre (Kenya Census, 1979). These figures re-emphasizes the fact that Meru district is experiencing disguised underemployment in agriculture.

Maize, the main staple food is grown in the whole district. The varieties in the Highlands take time to mature, whilst, varieties in the lower areas take 3-4 months. Beans are also widely grown in the district.

Due to variations in climate and soils there is a regional imbalance in so far as opportunities

for cash earning enterprises are concerned. At present better income-earning opportunities are found in the highlands. The high altitudes produce tea, coffee, pyrethrum, maize and even milk. These are also the areas with high population densities in the district.

Nonetheless, the potential for agricultural production in the lower areas has been fully recognized to redress the regional imbalance in the economic development in the district. Scattered irrigation schemes have been established in these areas.

Apart from agricultural land, quite a large chunk of the district consist of forest reserves and the National Parks.

2.3.2 (b) MAJOR AGRICULTURAL ACTIVITIES

Agriculture is the mainstay of Meru economy and Kenya as a whole. The District has 532,000 hectares of agricultural land. The high potential areas which constitute 155,000 hectares have good soils and adequate rainfall for both cash and subsistence crops; whereas the medium and marginal areas constitute 250,000 and 124,800 hectares

TABLE 10:

COFFEE PRODUCTION IN MERU DISTRICT 1975-1984

YEAR	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Area in ha.	12,452	12,452	12,452	12,457	6,300	15,000	32,000	36,000	34,391	34,581
Production in tons	9,185	7,626	10,894	11,498	4,850	11,358	13,305	12,298	10,088	11,740
Over yield (Kg/ha.)	738	612	875	923	770	752	611	393	292	339

Source: Coffee Board of Kenya (Nil Estates).

The decrease in production is attributed to a fall in prices after 1978, unfavourable weather conditions especially 1984, and poor management of farms. Despite the fall in coffee prices in the world market the area under crop has continued to rise.

(ii) TEA

The second largest income earner has also made notable progress since 1976. The area planted with the crop increased from 4,609 hectares in 1976 to 6,557 hectares in 1984. The production has increased as well from 15,674 to 19,177 tonnes in 1976 and 1984 respectively. Also the number of tea growers have increased from 12,211 to 17,003 in 1976 and 1984 respectively. The increases can be attributed to high prices of tea in the world market the prices of tea have always been on the increase (Table no. 11).

TABLE 11:

TEA PRODUCTION IN MERU

YEAR	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Area in Hectares	4,609	5,250	5,616	5,759	5,852	6,126	6,322	6,322	6,557
Production in tonnes	15,674	9,998	11,597	16,073	14,053	13,386	15,313	20,666	19,177
No. of growers	12,211	14,225	14,769	14,934	25,259	-	-	-	17,003
Yield per ha. (Kg. (Kg/Ha)	2,029	1,767	1,878	2,469	2,042	2,185	2,422	3,269	2,925

Source: Min. of Agriculture and Livestock Development Meru Annual Reports, 1975-1984.

K.T.D.A. has been fixing expansion for each year and farmers have also known that tea growing is an enterprise with good returns. Prices have been reasonable and the K.T.D.A. has provided a good effective management system. There is a likelihood that tea growing will continue in the district, due to the fact that the commodity is commanding a good market.

(iii) COTTON

The hectarage under cotton crop increased considerably; mainly because it is the only cash crop in the low potential areas. There was however, a large drop in the production because of unfavourable weather conditions especially in 1979 and 1980; and also because of lack of efficient organized marketing and delays of payments to farmers (Table No. 12).

The area under crop increased from 3,150 hectares to 22,000 hectares in 1974 and 1984 respectively. the yields, also increased from 2,971 tonnes to 5,413 tonnes in 1974 and 1979 respectively; though the production has fluctuated from one year to the next.

TABLE 12:

COTTON - AREA AND PRODUCTION

	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Area (ha.)	3,150.4	2,906.7	2,984.2	8,476	10,932	12,448	14,670	10,000	10,000	15,000	22,000
Production (Tonnes)	2,971.2	2,430.7	1,640.8	3,688.9	3,803.8	5,413.0	2,753.5	2,160	2,286	5,304.5	3,844
Aver. Yield (Kg/Ha.)	941.1	836	550	435	348	435	188	216	229	354	175

Source: Meru District Annual Reports 1974-1984. M.O.A. and L.D. (with Minor Modifications).

(iv) PYRETHRUM

Hectarages under this crop have dropped tremendously due to poor prices and lack of organized marketing system. The area under the crop dropped from 1,306 hectares in 1974 to 234 hectares in 1984. The area under pyrethrum was at its height in 1975 when 1366 hectares were planted (Table No. 13).

Dur to poor prices, the prospects for pyrethrum growing are very unpredictable in the district.

SUNFLOWER

Hectarages of sunflower appears to have increased though yield seems to have gone down (Table 14). Area under sunflower increased from 150 hectares in 1974 to 2,520 hectares in 1983. The drop in yield is attributed to lack of organized marketing system. The district has a high potential for sunflower growing, but no incentives are given to farmers.

TABLE 13:

PYRETHRUM AREA PRODUCTION

YEAR	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Area in hectares	1,306	1,366	-	-	300	270	350	408	340	238	234
Production in Tonnes	300.6	351.9	346.2	142	128	85.8	109.5	184	310	136.1	85.0
Av. Prod. Kg/ha.	230	258	-	-	427	318	313	451	912	572	363

Source: Meru District Annual Report, 1974-84, M.A.O. and L.D.

TABLE 14:

SUNFLOWER PRODUCTION

YEAR	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Area in heactares	150	1,080	4,800	7,000	955	1,200	1,500	1,725	2,498	2,520	778
Production in tonnes	24	358.6	1,802.6	2,628.8	955	1,300	1,200	1,380	1,518	2,200	339.2
Aver. Prod. (Kg/Ha.	160	332	376	376	1000	1083	800	800	608	873	436

Source: Meru District Annual Reports, 1974-84, Ministry of Agriculture and Livestock Development.

TOBACCO:

This is a crop which is grown around Mitunguu - Gaitu - Mikinduri - Chuka zone by well over 1000 farmers. It is grown under the auspices of B.A.T. Kenya Limited and the Tobacco growers cooperative. However, tobacco production is not confined to Meru. There are other four divisions in the country: Bungoma - Busia, South Nyanza-Migori and the Central Area. In total there are five tobacco growing areas in Kenya.

The tobacco production trends in Meru have indicated a steady rise from 18 tonnes (1974) to 681 tonnes (1985). Nonetheless, there has been ups and downs between 1974 and 1985, due to B.A.T. Regulatory system which are meant to reduce the excess supply. Farmers grow tobacco on contract services by B.A.T.; hence the whole tobacco produced (yields) is normally bought by B.A.T. (Table No. 15).

In 1984, the production was 983 tonnes, the highest since 1974. This high yield brought the problem of oversupply at this particular year. The B.A.T. was unable to purchase the whole tobacco from the farmers. A lot of losses were experienced.

TABLE 15:

TOBACCO PRODUCTION FIGURES 1974-85

CROP YEAR	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Production (Tonnes)	18	82	151	452	283	196	382	555	612	773	983	681
Hectares	78	107	441	977	790	245	396	540	509	695	725	484
Average Yield (Kg/Ha.)	231	393	342	453	338	800	964	1025	1200	1112	1355	1407
No. of farmers	147	171	688	1563	1377	600	800	1057	976	1077	1315	1024

Source: B.A.T. Annual Report, 1985.

FOOD CROPS:

The amount of food produced; maize, beans and potatoes has been substantial. Maize and beans are grown all over the district; whereas potatoes, sorghum/millet and wheat are confined to certain areas of the district.

(i) MAIZE

The hectares under the crop increased substantially between 1974 and 1984. In 1974, the area under maize crop was 33,362 hectares as opposed to 100,000 hectares in 1983. However, there appears to have been only a slight drop in the yield per hectare perhaps because of unfavourable weather conditions. After the experience of 1980, (37,000 tonnes) when there was a severe shortage of this grain one would expect the people and the government to have stepped up their efforts towards its production (Table No. 16).

(ii) BEANS:

Like maize, the production of beans has increased substantially. In 1976, the area under beans was 21,000 hectares as opposed to 51,000 ha. in 1982. Also the average yield per hectare has increased consistently from 387 kgs/ha in 1976 to 900 Kgs/ha in 1983. The yield has also increased tremendously from 8127 tonnes in 1976 to 113,312 tonnes in 1984.

(iii) SORGHUM/MILLET PRODUCTION

The area growing sorghum and millet increased to some extent between 1976 and 1983.

TABLE 16: MAIZE PRODUCTION

YEAR	1976	1977	1978	1979	1980	1981	1982	1983	1984
Area in Hectares	35,000	36,130	44,457	76,300	82,000	90,000	99,000	100,000	47,928
Production in Tonnes	57,600	64,103	56,823	62,296	36,947	162,000	178,200	93,500	4,310
Aver. production (Kg/Ha.)	1,646	1,774	1,278	882	451	1,800	1,800	935	90

Source: Meru District Annual Reports, 1976-1984.

WHEAT:

There has been an increase in area under wheat from 6,950 hectares to 12,325 hectares in 1974 and 1984 respectively. However, yield per hectare decreased due to subdivision of large scale farms (Kibirichia and Timau); and the bad weather conditions.

OTHER CROPS:

Other crops grown in the district include, citrus fruits, mangoes and horticultural crops (cabbages, tomatoes, potatoes and bananas).

The hectarages under citrus fruits have increased over a number of years. In 1974, 484 hectares were under citrus as opposed to 2,300 hectares in 1983. Conversely, the yields have shown some increase to some extent.

Mango production in the district also is fairly good. There were only 150 hectares under mangoes in 1977; and this increased to 374 hectares in 1984. It is clear that with incentives to the farmers more production could be realized. Right now, there is lack of organized marketing machinery. (Table No. 18).

The major fruits of importance in Meru are citrus and Mangoes. Their production figures are shown below:

HORTICULTURE

The major horticultural crops in the district are potatoes, tomatoes and cabbages. Potatoes are mainly grown in Kibirichia in large quantities. Tomatoes and cabbages are grown in three divisions: North Imenti, South Imenti and Nithi. The horticulture crops, in certain areas, are grown by irrigation.

Potatoes are produced on large quantities in Kibirichia, where much of it decay in stores due to lack of market outlets. Other areas which grow potatoes in small quantities are south Imenti, North Imenti and Nithi Divisions of Meru. The three divisions use

TABLE 17:

CITRUS FRUITS PRODUCTION AND AREA

YEAR	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Area Under Crop (Ha.)	484	520	720	1,000	1,366	1,371	2,000	2,050	2,100	2,300	1,820
Production in Tonnes	4,033	4,860	5,200	N/A	26,891	26,941	22,500	2,600	2,300	2,500	2,942
Aver. Production (Kg/Ha)	8,333	9,346	7,222	-	19,686	19,651	11,250	1,268	1,095	1,087	1,617

Source: Meru District Annual Reports, 1974-1984

TABLE 18:

MANGOES PRODUCTION

YEAR	1977	1979	1979	1980	1981	1982	1983	1984
Area (Ha.)	150	150	150	160	180	190	258	374
Production (Tonnes)	1,200	1,200	1,500	1,600	1,700	1,900	1,941	2,119

Source: Meru District Annual Reports, 1977-1984.

modern technology to increase the yield especially through irrigation during the dry spells. Potatoes are normally consumed by the local population, and thus the absorptive capacity of the local market is good. Nonetheless, in Kibirichia, more than half of the production decay in stores. Even the amount sold is offered at a throw away prices due to excessive supply.

Bananas have become a significant cash earner in certain parts of the district mainly in Tigania and Igembe divisions. Bananas are important mostly as a subsistence crop as production for market is constrained by poor marketing arrangements. Most of the bananas are sold outside the district; though the marketing machinery is very poor.

Tomatoes and cabbages are the most popular vegetables in Meru District. They are mostly grown in North Imenti, South Imenti and Nithi Divisions. However, there exists a considerable production potential for horticultural crops. The crippling problem in the production is lack of organized marketing system. Infact, it is very annoying to mention that much of the production rots in the farms. (Table no. 19)

HORTICULTURAL PRODUCTION (AREA AND YIELD)

The major horticultural crops in the district are: Potatoes, tomatoes, cabbages and bananas. Their production figures are shown.

TABLE 19:

HORTICULTURAL CROPS PRODUCTION

	1976	1977	1978	1979	1980	1981	1982	1983
BANANA								
Area (Ha.)	8,200	8,610	6,924	75,000	8,000	8,000	8,000	11,000
Production (Tonnes)	-	7 mill	7.4 mill	2.9 mill	2.7 mill	3.0 mill	3.5 mill	3.7 mill
CABBAGE								
Area (Ha)	700	750	433	308	400	450	500	500
Production (Tonnes)	42000	45000	6857	5630	4000	4500	5500	5,500
TOMATO								
Area	500	550	924	150	200	250	300	300
Production (T.)	30,000	31,000	2,981	3,500	2,900	2,950	2,500	2,500
POTATO								
Area (Ha)	7,250	7,050	9,500	10,070	12,300	12,500	115,000	12,500
Production (T.)	145,210	45,500	95,000	10,070	94,800	150,000	92,000	94,000

Source: M.O.A. and L.D. Meru Annual Reports (AGR)

DAIRYING

Compared to other agricultural activities, dairy farming is relatively poor. Pasture farming for feeding the animals is done without any application of fertilizers. Dairying, however, is carried on large scale farms (Timau) and small scale farms in North Imenti, South Imenti and Nithi, Divisions. In 1974 there were 62,000 cows as opposed to 46,589 in 1984. The trend shows that there has been a decrease in the numbers, partly because of the subdivision of large Dairy Farms and unconducive weather conditions. The milk production was 3.2 million kilograms in 1974 and 5.3 million Kgs. in 1982. The district produces over 10 million kilograms of milk per year out of which a certain fraction is sold to K.C.C. Meru Dairy Plant and local markets. The rest is consumed at home

Table No. 20.

The introduction of Grade Cattle was aimed at increasing milk production both for sale and home consumption.

TABLE 20: NUMBER OF COWS AND MILK PRODUCTION -
1974 - 1984

YEAR	1974	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84
No. of cows	62,000	35,000	20,275	43,000	46,365	46,465	-	-	-	47,457	46,589
Milk Production (Kilos in '000,000)	3.2	-	2.7	3.1	3.2	2.6	3.3	4.4	5.3	5.1	4.4

Source: District Annual Reports (Meru).

OTHER ANIMALS AND THEIR PRODUCTS

The other animals kept include , sheep goats, rabbits and pigs. Also there are indigenous cattle which are kept in big ranches (northern grazing area) to provide meat. In 1975 16,896 cattle; 10,760 sheep and 13,304 goats were slaughtered in the district. In the following year (1977) 31,565 cattle were slaughtered. The figures reveal that meat consumption rate is high in the district. Thus well over 100,000 animals are slaughtered every year.

Consequently, the skins and hides from the slaughtered animals are not economically used. There is no tannery in the district to process hides and skins. Moreover, there is no organized market outlet for the products. (Table No. 21)

TABLE 21: HIDES AND SKINS PRODUCTION

YEAR	1975	'76	'77	'78	'79	'80	'81	'82	'83	'84
Hides	48,179	-	-	58,760	33,100	-	-	29,944	49,960	72,747
Sheep skins	99,940	-	-	135,410	45,436	-	-	28,760	42,394	-
Goat skins	35,855	-	-	85,000	64,253	-	-	15,961	72,640	-

Source: Meru District Annual Reports M.O.A. and L.D.

The preceding analysis of the production trends can now be used to assess the crop production capacity and the potential of the district.

In high potential areas, most of the land here is already put into use and expansion in production of both cash (industrial) and subsistence crops calls for more intensive use of the land and improved yields per unit area rather than increased hectares. This can be done by better training of farmers and agricultural extension officers. There is also a serious need to improve on the marketing channels of crops such as potatoes, sunflower, tomatoes, cabbages, cotton mangoes; to mention a few.

With the fast growing population and the concomitant pressure on land, it is becoming necessary to use medium and low potential areas more intensively than has been the case previously in order to become self-sufficient in food production.

Subsequently, the produce prices of most of these crops should be reviewed often so that farmers are given the incentive to produce more so as to procure surplus for agro-industries which are viable in the district.

Storage facilities need to be expanded and improved to be able to buy cereals from almost all the farmers, rather than buy from very few, farmers, as it is the case today.

Introduction of agro-industries to process some of the crop products such as potatoes, sunflower, and cotton seed and to extract oils which can be used in the manufacture of other products like fats, soaps etc. are necessary. The fruit processing (citrus fruits and mangoes) can also be undertaken to make juices and this can provide market outlets for most of the horticultural crops. All in all, the district has surplus agricultural production for agro-industries; and even though, the production can be increased through intensive farming methods.

2.4 DESIGNATED SERVICE CENTRES:

One of the fundamental objectives of the government of Kenya is to direct an increasing share of the resources available to the Nation towards the rural areas. The Government believes that if the quality of rural population is to be improved then the people in the rural areas must be provided with basic services such as Health Services, markets, sanitation, water, power, education and others. To this end, the government has worked out a policy which consists of a network of designated service centres and into which the above facilities should be concentrated and which at the same time ensures a more equitable and rational geographical distribution of infrastructural facilities and social services in terms of population distribution over the country.

The designated service centres are expected to perform three main functions: service function, that is provide schools, health services public utilities etc., economic function (provide employment in for instance industrial, commercial and other service functions); and residential for people working in non-agricultural employment for example the people employed in industrial, commercial etc: sectors. Thus the National Service Centre Policy aims at giving development into 4 different categories of centres

in order of importance: Designated Urban Centre, Designated Rural Centre, Designated Market Centre and Designated Local Centre.

Meru has quite a number of such designated service centres which are distributed through out the district to improve the quality of life in the rural areas and to complement and stimulate integrated rural development. The district has one principal town (Meru), four designated urban centres, seven designated rural centres; twenty five designated market centres and 43 designated local centres. (Map. No. 2). The service centres not only serve the people in the towns but also those in the surrounding rural areas. The four urban centres are: Nkubu, Chuka, Chogoria and Maua; and the seven rural centres are: Igoji, Kanyakine, Marima/Muthambe, Marimante, Miathene, Kangeta and Lare.

The service centres are expected to perform service, economic and residential functions. It should, however, be noted that not all the service centres have the necessary basic infrastructure and social services as discussed below.

2.4.1 BASIC INFRASTRUCTURE AND SOCIAL SERVICES

(a) ROADS:

Meru district at present has 1511 kilometres of classified roads with only 165 of these being tarmac and 520 gravelled.⁵⁸ The rest of the roads especially class "E" although passable through out the year pose a major problem during rainy season. Most of the classified roads radiate from Meru Town. The unclassified feeder roads which form an important rural road network especially transportation of agricultural produce to marketing centres are in a very poor state. The roads have been neglected (Map No. 8).

As at 1978 there were 19 km.-of classified roads and 0.09 kilometres of tarmac roads per 1000 people, while there were 0.15 kilometres of classified roads 0.007 kms. of tarmac roads per 1000 people in 1972.⁵⁹ There has been very little improvement.

58. Meru, District Development Plans, 1974-78 and 1979-83.

59. Meru, D.D. Plan 1979-83 p. 70.

TABLE 22: PRESENT ROAD NETWORK IN MERU

Class A - (A ₂)	Meru-Nanyuki and branching to Isiolo
Class B - (B ₆)	Nkubu-Embu road via Igoji, Chogoria and Chuka Town.
Class C - (C ₉₁)	Meru Town - Meru National Park road.
Class D - (D ₄₈₂)	Meru Town - Giaki-Mbeu-Mikinduri (Untarmac)
Class C - (C ₉₂)	Meru Town - Gaitu Ginnery (Through Tharaka Division) Murramed.

Source: District Development Plan (Meru) 1979-83.

The district does not have satisfactory air fields. The existing ones are poorly located and not nicely maintained. The problem of transportation and roads in Meru District cannot be under-estimated especially when one considers the utilisation of resources in the district.

(b) POWER AND COMMUNICATIONS

Different parts of the district are served with telephone services and electricity. However, the main problem regarding the provision of electricity and telephone lines is that these services have not been installed in various service centres in the district.

Conversely, the post services are not installed in many service centres. The existing sub-post offices and full-post offices are: sub-post offices - Githongo, Kiirua, Timau, Kibirichia, Marima, Igoji, Nkubu, Mugumoni, Kangenta, Marimanti, Chiakariga, Kianjai, Mikinduri, Muthara, Mitunguu and Kanyakine, Full-Post Offices - Chogoria, Chuka and Maua.

The current telephone exchange operating in the district are located at Meru Town, Timau, Chuka Chogoria, Lane, Maua, Kianjai, Igoji and Nkubu. All these services are far from adequate especially when one considers the size of the district.

(c) WATER

Most of Meru is relatively well served with water by permanent rivers from Mt. Kenya and the Nyambene hills. As at 1973 there were 145 water schemes in operation. Many were constructed by self-help assisted by the government funds and personnel. Greater number of these projects are located in the upper parts of the district. In certain areas like Tharaka water supply is very inadequate during the dry seasons.

(i) RURAL WATER SUPPLIES

There are six main rural water supplies in the district:

. Mitunguu water scheme sensing	20,000 people
. Nkachie/Kanyakine W.S.	8,000 "
. Tigania W.S.	25,000 "
. Mwimbi W.S.	24,000 "
. Karingani W.S.	37,000 "
. Timau W.S.	

Boreholes are not prevalent in the district except Muthambi Girls and Kanyakine Catholic Mission who draw their water from boreholes. These boreholes were dug by the Ministry of Water Development.

(ii) URBAN WATER SUPPLIES

The main urban centre water supply project is serving well over 30,000 people majority of whom are in Meru Town. Some of the service centres get the water supply from the Rural Water Schemes installed through self-help contributions.

(iii) IRRIGATION WATER

There are not many large irrigation schemes in the district except the small schemes at Kanjoo, Materi Girls and Tharaka Secondary Schools and water furrows on isolated vegetable gardens in the

higher and middle altitude of North and South Imenti. There are no large irrigation scheme undertakings in the district.

(d) HEALTH SERVICES

With a population of well over $\frac{3}{4}$'s of a million Meru is one of the populous districts in Kenya.

In terms of provision of medical services, the district has one government hospital and 4 missionary hospitals and one sub-hospital . It has 5 maternities, 8 health centres and 76 dispensaries of which one maternity, eight health centres and 33 dispensaries are run by the government. The remaining are run privately or by various church organizations.

Meru District hospital has 241 authorized beds distributed among medical surgical, children maternity and eye wards. The 8 health centres and 33 dispensaries run by the government are under Meru District Hospital which is located in Meru Town. The distribution of these health institutions is far from even.

Chogoria P.C.E.A. hospital caters for 200,000 catchment population. It is located in Nithi Division the hospital has 204 beds with 2 theatres X-ray

and laboratory facilities. It manages 14 dispensaries all in Nithi Division except one which is in South Imenti the hospital has a community Nursing school with 150 students.

Nkubu Consolata Hospital - is a Catholic Mission hospital with 260 beds, a theatre and laboratory facilities. It manages 17 dispensaries and 4 maternities. The hospital has a school of Nursing with 107 students.

Maua Methodist Hospital caters for a population of 250,000. It is in Igembe Division and has 160 beds with theatre facilities; does not run any dispensary but it has a nursing school with 80 students.

The five hospitals and one sub-hospital have a total of 977 authorized hospital beds. The bed space are as follows:

- Meru district hospital	241 beds
- Nkubu	260 "
- Chogoria	204 "
- Maua	130 "
- Tigania	42 "
- Chuka sub-hospital	100 "
Total	<hr/> 977 " <hr/>

As at 1983, the ratio of bed to population was 994 as opposed to 1022 persons per bed in 1977. By any standards, there has been an improvement since 1977.

Delivery of medical services has also been constrained by lack of transport to deliver drugs and to assist in transferring those patients who require doctor's attention. Also as at 1983, Meru district hospital had 9 doctors as opposed to only 4 doctors in 1977.

(e) EDUCATION

(i) Basic Education:

In 1979 Meru district had 672 primary schools with enrolment of 199,260 pupils and 5,597 teachers. In 1983, the number of primary schools had gone up to 706, with enrolment of 222,892 and 7048 teachers.

(ii) Higher Education

In 1978, the district had 25 government maintained secondary schools with enrolment of 3,993 students; and 76 Harambee Secondary schools, a total of 101 secondary schools. In 1983, government maintained schools were 29 with total enrolment of 10,940 students and 428 teachers. There is poor provision of physical facilities in these schools.

(iii) Training Institutions:

The district has two Teacher's Training Colleges. Both train 740 students every year. Meru Teacher's College train 200 students, whilst Egoji Teachers' College train 540 students every year. Staff establishment is 31 tutors for Egoji and 21 tutors for Meru Teacher's College.

About 10% of Meru College enrolment are students from Meru District while about 20% of Egoji College students enrolment are from the district.

(iv) Village Polytechnics:

There are eleven village polytechnics schools in the district, seven of which are properly assisted by the Central Government. The average number of students per school is 20 while that of teacher is 4. These village polytechnics are not fully utilized.

2.5 CONCLUSION

In this chapter we have discussed physical background of the district, the socio-economic situation (demographic characteristics, land carrying capacity and agricultural activities carried on) and provision of basic infrastructure.

It has been shown that the district is predominantly agricultural in character and because of the small agricultural land and increasing population, it is facing population pressure problems (specially in high potential areas).

In order to increase or maintain the standards of living, it is necessary that income earning opportunities be found outside agriculture to employ surplus labour. In short/medium run, the aim must be to increase the agricultural production with a view to attaining self-sufficiency in agriculture production and be able to supply the existing industries with raw material. This can be done through intensive husbandry of both food and cash crops.

It is clear from the survey findings that the distribution of basic infrastructure is far from enough. The situation is pathetic when one considers road network system and other trunk services like (electricity) power etc. Very few kilometres of roads are tarmaced in the district.

THE INDUSTRIAL ACTIVITIES IN MERU DISTRICT:
A CASE STUDY

3.0 INTRODUCTION:

This section discusses the industrial activities and their impact to the regional economy in Meru. The industrial activities are divided into: (a) small scale and; (b) large scale manufacturing enterprises. Their impact to the regional economy is seen in terms of employment creation and raised rural incomes. Thus their contribution to the process of rural development is discussed in so far as they provide employment opportunities, raised rural incomes, basic infrastructure, and provision of goods and services needed in the rural areas.

(a) According to UNIDO, small scale enterprise is an enterprise having fewer than 25 workers employed. These are mostly craft-based manufacturing and a wide range of small scale services and activities such as: tailoring, metal works, carpenters, shoe repairers, sawmills, garages, posho mills, cycle repairers, radio/watch repairers, hairdressers, photographers etc. Some of the small scale manufacturing enterprises are commonly referred to as "informal activities". They generate employment at lower capital costs than the modern sector. The sector is also easy to enter on owner's savings; and uses local materials and discards from modern sector.

Most of the small scale enterprises tend to locate in towns and the periphery of big cities like Nairobi. In this study it was observed that majority of the small scale enterprises are to be found in the principal town (Meru). They normally tend to locate where the market prospects are high for their products.

Subsequently, it was observed that other small scale enterprises were commonly found in the rural areas, for example pitsawyers and charcoal burners.

Conversely, the small scale enterprises combine labour-intensive and adopted technology. It is clear from this that small scale enterprises are making a significant contribution to the process of rural development by providing employment. They provide income earning opportunities for a large number of people; though it is often regarded as unproductive and stagnant. Thus the study of small scale enterprises helps one to appreciate the vital role played by the undertakings in the process of rural development in terms of providing employment and rural incomes.

(b) The large scale manufacturing enterprises identified in Meru were the agricultural processing plants (industries); Coffee, tea, maize, cotton, milk, and timber. These were the only manufacturing enterprises of significant in terms of providing

employment opportunities and income in the rural areas of Meru. They range from food to non-food processing manufacturing enterprises. The six processing industries have a significant impact to the regional economy in form of regional multiplier effects. Apart from employment creation, and raising rural incomes; the processing industries provide basic infrastructure, goods and services and set in motion other economic activities in the district.

The contribution of industrial sector in the process of rural development is seen in the light of the National Policy framework. Thus the section starts by examining the national policies on: industrial and rural development. It is seen that the policies are intertwined, and that they emphasize industrial and agricultural development as precursor to rural development. Hence it would be wrong to assume that a country like Kenya can experience development by giving priority to industrial development and down-playing agricultural sector. Any policy geared toward rural development should address itself to agricultural sector. Eighty five percent of Kenya's population reside in the rural areas practising agriculture.

Consequently industrial and agricultural sectors are complementary and supply inputs to each other. Hence the policy priorities the two sectors as very vital and inseparable in the national development process.

In nutshell, the section examines the significance of agricultural processing industries (plants) in the process of rural development in terms of providing employment opportunities and raising rural farm incomes. This is reviewed partly in the context of their relevance to the Meru District's case study, and partly for providing valuable guide lines on possible future strategies for industrial development, particularly agricultural processing; and understanding the role played by these manufactural enterprises in the process of rural development. The small scale enterprises are examined in passing to elucidate on their importance to the national economy.

3.1 NATIONAL POLICIES

The development objectives in Kenya derived from sessional paper No. 10, 1965 on, "African Socialism and its Application to Planning in Kenya", and aim broadly based on development of the whole economy rather than very rapid development of no more

than one or two relatively small sectors of the economy.⁶⁰ The National Development Plan 1964-70 focusses on rapid growth, whilst, the 1970-74 plan attempted to shift growth towards the rural areas.

The National Development Plan 1970-74 points out that industry and agriculture are complementary with each other. In addition to faster industrial growth; the plan projects a change in the structure of the industrial production as the country moves to a, "higher level of industrialization involving greater capital investments and more sophisticated techniques."⁶¹ It is estimated that employment in manufacturing industry as a whole will expand. The less developed countries have wrongly based their development strategy on the belief that industrialization would bring about economic development more quickly.. They have always taken industrialization as a measure to cure their panacea social ills of unemployment. Thus, the 1970-74 plan states that manufacturing by itself is not going to offer solution to the Kenya's unemployment problem.

Note: Unemployment is traditionally defined to consist of those who have zero incomes or work zero hours and who are seeking jobs, but are unable to

60. Republic of Kenya: African Socialism and its Application to Planning in Kenya: Ses. Paper No. 10 1965.

61. National Development Plan 1970-74 pp. 304.

find them.⁶²

Kenya's industrial policy aims at:

- (a) faster industrial growth;
- (b) growth of import - substitution industries where these should also cover local manufactured goods and processed raw materials;
- (c) increase of government participation in terms of promotion and financing; and
- (d) a change in the structure of industrial production involving greater capital investment and more sophisticated techniques.⁶³

The policy emphasizes faster rate of industrial development with special attention to import-substituting industries.

Sessional paper No. 10 1973 on Employment proposed a new industrial strategy which favoured rural areas where majority of Kenyans reside. The strategy involves some turning away from import-substitution as a strategy and focussing future industrialisation upon:⁶⁴

62. Republic of Kenya: Sessional Paper on Employment, May 1973 (Sessional Paper No. 10 1973).

63. 1974-74 National Development Plan, op. cit.

64. Sessional paper No. 10, 1973 on Employment, op. cit page. 36.

- (a) industries using domestic raw materials;
- (b) industries with potential for competing successfully in export markets;
- (c) industries which are relatively labour intensive;
- (d) industries which would generate demand for raw materials and the intermediate products of other domestic industries; and
- (e) industries which can be located in small towns and rural areas without substantial increases in costs.

The type of industries which meet the conditions of this strategy are typically those involved in the processing of agricultural products or which are otherwise supplied by extractive industries.

The 1979-83 Development Plan clearly states that manufacturing sector, "will play a major role in expanding incomes and in the alleviation of poverty." The plan highlights that in 1977 the sector employed 118,000 people which was 13.1% of the total wage employment in the economy.⁶⁵ Hence with future rapid expansion of the sector it will be looked upon as a major source of employment opportunities and income for urban as well as rural people.

65. Kenya National Development Plan 1979/83 pg. 325.

Industrial development objectives expressed in 1979 - 83 Plan envisages production for domestic and foreign markets. This would lead to a better utilization of domestic resources, creation of employment opportunities and saving or earning of foreign exchange. Thus (a) reduction of dependence on foreign inputs, e.g. agricultural inputs; and (b) creation of employment opportunities (this will reduce the unemployed school leavers) is likely to be boosted by industrial development.

The 1984/88 Development Plan spells out explicitly the long term goals of socio-economic significance:

"-- diversification of national economy, accomplishment of rapid rate of economic growth, improvement in export performance, production of supplies required to support development in the primary sectors of economy, employment generation, production of goods and services to meet the basic human needs--, dispersion of industry and equitable distribution of the fruits of industrialization".⁶⁶

The plan recognises the importance of industrialization; because industries bring about the desired human settlement patterns. These people will have the access

66. National Development Plan 1984/88, Page 196.

to the fruits that accrue to the process (industrialization). The plan further mentions that the emphasis would be on export oriented, resource based and labour intensive industries.

On employment generation, the plan discusses that it will be achieved by laying emphasis on further growth and diversification of industries with high labour intensity, viz, sugar, textiles, wood working and so on. Particularly, on agro-based industries the plan spells out that the government will review and improve the price structure (agricultural produce) of inputs and outputs and financing structure of mills in which public funds are invested.⁶⁷ On informal sector; the Development Plan 1984-88 summarizes the critique by offering some of the strategies intended to be adopted in the current plan period to realize the benefits which accrue in the informal sector. The plan states in part:

"in the field of small and cottage industries the emphasis will shift from capital intensive modern industries to skill based industries. Intermediate technology will be promoted. A full fledged cottage industries will be established in the Ministry of Commerce and Industry to monitor the implementation of the small scale industries development programme

67. Ibid pg. 1978.

and to provide assistance to the individual extension service in collaboration with the project studies division."⁶⁸

Further the plan states: "The Ministry of Commerce and Industry will in collaboration with the Ministry of Culture and Social Services prepare a coordinated plan for the development of handicrafts and cottage industries with the object of diversifying handicrafts production, creation and design development, facilities, establishment of common production services and organization of craftsmen to facilitate the procurement of supplies and to render credit assistance."⁶⁹

From this, it is clear that the government recognises the importance of small scale industries because they raise employment levels through labour intensive techniques as opposed to high level mechanization and automation. The recognition of the sector by the government came after the 1972 ILO Report which recognised informal sector as one of the most neglected sectors of the economy which however, if recognised could lead to a high employment generation zone. The report continues to state that:

68. Ibid pp. 196

69. Ibid pp. 196.

"The informal sector provides income earning opportunities for a large number of people; though often regarded as stagnant and unproductive. We see it as providing a wide range of low cost labour intensive competitive goods and services. Not only does it provide them without the benefit of the government subsidies and support that are received by many firms in the formal sector, but operators in the informal sectors are often harassed and hampered by restrictions imposed from outside. We therefore advocate a positive attitude on the part of the government towards the promotion of the informal sector."⁷⁰

On the question of unemployment, the Report stated that this problem could only be meaningfully attacked from the roots and not at the stem. This could be achieved through the country's technology and organization in manufacturing and the total industrial sector. In view of this, one can contend that the difficult of unemployment problems and very low level of industrialization, most countries and territories of the region cannot afford to ignore even the smallest of industrial enterprises, including those that hardly differed from artisan activities.

70. ILO Report 1972. (Kenya).

Conclusively, because of the strong interdependence between industrial growth and growth in other sectors of the economy industrialisation policy in the broadest sense might be virtually indistinguishable from development policy in Kenya. But it is important to note that all National Development Plans recognises the importance of industrial development and other sustaining sectors like agriculture. Agriculture and industry are complementary and are precursor to better standards of living in the rural areas.

3.2 INDUSTRIAL ACTIVITIES:

Meru District economy is nearly exclusively agricultural, and non-agricultural activities are very limited in scope. The existing industrial activities, though few, are the small scale manufacturing enterprises (mostly urban based) and the agricultural processing (plants) industries. These industrial activities have, a very important role to play, if at all, the development of the district is to be achieved.

This observation becomes evident considering the density of population and its further increase in connection with the scarcity of land and the continuance of subdividing the already existing smallholder farms. This situation implies the danger of an increasing part of the land being required

for subsistence production may be accompanied by stagnation or even reduction in cash crop production. To avoid this state of predicament, income and employment will have to be created at an increasing rate from non-agricultural activities.

It has been observed that Meru has a high agricultural potential which may induce industrial growth, particularly the agricultural processing industries (plants). The industries will reduce unemployment problem in the rural areas. At present industrial enterprises of large scale in nature are virtually non-existent in the district. Thus future industrial activity may be seen in the light of the present minimal basis.

This section attempts to examine the role of industrial activities in the process of rural development using Meru district as a case study. The rural development indicators envisaged in the analysis are: employment opportunities, income generation and income levels, provision of basic infrastructure and other activities set in motion by such industrial activities.

3.2.1 SMALL SCALE ENTERPRISES:

According to UNIDO, a small scale enterprise is an enterprise having fewer than 25 workers employed. These are wide range of small scale services and activities like; tailoring carpenters, shoe repairs, garages etc. These industrial activities are commonly referred to as "informal activities". They are mostly found in towns and periphery of big cities.

According to ILO, the informal activities are a way of doing things characterised by (i) ease of entry (ii) reliance in indigeneous resources (iii) family ownership of the enterprises (iv) small scale of operation (v) labour intensive and a dopted technology (vi) skills acquired not through the formal school system and (vii) unregulated and competitive markets.⁷¹

Sinclair (1978) defines the sector: "people in the cities of developing countries of the world turn to find subsistence in small scale enterprises run by themselves friends and relative or strangers. The myriad forms this response has taken have emerged as one blanket term in the literature

71. ILO (1972) Ibid.

'informal sector'"⁷²

It is clear that informal sector is an urban phenomenon and generates employment at lower capita costs than the modern sector and creates income per worker equal to or greater than of the traditional sector.

Informal sector include rural self-employed, rural wage labour, urban self-employed and urban wage labour. The location of informal sector is mostly in small towns in the rural areas which appear to provide the most optimal breeding ground for informal sector activities.

In Kenya, the sector developed spontaneously rather from overt public policy. It includes craft based manufacturing and a wide range of small scale services and trade activities. It appears most obviously in small towns in the rural areas and on the periphery of the big cities. The sector combines the labour intensive and adapted technology, hence contributes to employment creation in both urban and rural areas. However, this study has not attempted to find out the number of people employed in informal sector in Kenya.

72. W.S. Sinclair (1978) Urbanization and Labour Markets in Developing Countries, London pp. 79.

The study done by Williams and Kabagambe (1985)⁷³ in Meru on Small Scale Enterprises revealed that a substantial number of people were employed in small scale enterprises (Table 23). The small scale enterprises are located in designated service centres in the district. Williams and Kabagambe visited fifteen centres and interviewed 54 enterprises on issues pertaining to their businesses. They observed that majority of the enterprises were located

TABLE 23: TYPE AND NUMBER OF INFORMAL INDUSTRIES AND THE EMPLOYEES IN MERU DISTRICT IN 1981

Type of entrprise	Number	Employment	Annual turnover (K£)
Tailors	14	25	45,219
Metal works	9	29	38,405
Carpenters	10	20	44,174
Shoe repairs	6	6	2,504
Sawmills	3	14	14,170
Garages	5	13	35,464
Posho mills	3	6	8,681
Cycle repairs	1	2	3,120
Radio/wat repair	2	3	5,655
Hairdresser	1	3	1,560
Photographer	1	3	3,900
Total	54	124	202,853

Source: Williams and Kabagambe 1985:11.

73. K.G. Williams and D. Kabagambe 1985: The Growth of Small Scale Enterprises in Meru Districts; I.D.S, University of Nottingham.

in Meru town where they had access to basic infrastructure. (Table No. 24).

TABLE 24: DISTRIBUTION OF EMPLOYMENT, BY SIZE AND TYPE OF ENTERPRISE IN MERU TOWN AREA, 1981

Type of Enterprise	Total employment	Total workers	Percentage
Tailors	11	25	20.2
Metal works	20	29	23.4
Carpenters	10	20	16.1
Shoe repairs	1	11	4.8
Saw mills	11	14	11.3
Garages	8	13	10.5
Posho mills	3	6	4.8
Cycle Repair	1	2	1.6
Radio/watch repair	1	3	2.4
Hairdresser	2	3	2.4
Photographer	2	3	2.4
Total	70	124	100%

Source: Williams and Kabagambe, 1985.

Williams and Kabagambe interviewed the following small scale enterprises: (a) tailors (2); (b) metal-works (14); (c) Carpentry (9); (d) shoe repairs (6); (e) sawmills (3); garages (5); posho mills (3);

cycle-repairs (1); radio/watch repair (2); hairdresser (1); and a photographer (1). The fifty four enterprises were interviewed on employment levels, financial capabilities and the problems they encountered in their operations

On employment levels, they observed that the 54 enterprises employed 124 persons, with metal works taking the lead, followed by tailoring. They noted, however, that these enterprises employed owners and one or two persons who were mainly relatives or friends to the owners.

The annual turnover from the enterprises was overwhelmingly good. In 1981, the enterprises had a total turnover of K£ 202,853. Assumably this amount of money was repatriated to the rural areas. Nonetheless the problems encountered by entrepreneurs in manning their businesses included: lack of loans, too few customers, insufficient profit for investment; too much competition and lack of enough outdoor space to expand the business.

From this, it is evident that small scale enterprises are providing income earning opportunities to the rural population. Employment in the sector

is therefore certainly to be preferred to subsistence agriculture unemployment, (open and disguised). The sector creates employment at lower costs than the modern sector and creates income per worker equal to or greater than the traditional agriculture. Hence the Government industrial policy should recognise the importance of small scale enterprises. They have a role to play in the process of rural development. They create self-employment and income earning opportunities.

Without an understanding of the small scale (informal activities) enterprises it would be very difficult to solve the problem of unemployment which is salvaging the less developed countries. Even the government policy of reducing unemployment problem in the urban and rural areas will be unachievable. Thus there is no country and territories of the region which can afford to ignore even the smallest industrial enterprises which can improve the standards of living of the people through income generation and employment opportunities.

3.2.2. LARGE SCALE ENTERPRISES (FORMAL): AGRICULTURAL PROCESSING INDUSTRIES (PLANTS)

The large scale enterprises (formal) identified in the district were concerned with the processing of agricultural produce. The agricultural produce which were processed are: coffee, tea, maize, cotton,

milk, and timber. The six were the only large enterprise which are significant in terms of employment creation, raising rural incomes and income generation, providing basic infrastructure in addition to providing goods and services. These processing plants also set in motion (trigger) other economic activities in the district. Hence they have a significant impact to the regional economy. (Table 25)

TABLE 25: TYPE AND NUMBER OF INDUSTRIES AND THEIR EMPLOYEES IN MERU DISTRICT

Type of Industry	Number	Division	Number of employees
Tea Factory	One	Tigania	100
	One	N. Imenti	50
	One	S. Imenti	50
	One	N. Imenti	100
Coffee Factory	200	All Except Tharaka	3000 Regular and casuals
Meru Dairy Plant	One	N. Imenti	48
Saw Mills	Eight	6-N. Imenti	242
		1-S. Imenti	16
		1- Nithi	20
Saw Benches	21	North & South Imenti	161
Pitsawyers	61	All Divisions except Tharaka	310
Total			4,887

Source: Author's survey.

3.2.2.1 COFFEE INDUSTRY

Coffee is the most important single industry in Kenya. The significance of this crop can be evaluated in terms of its place in total farm incomes, employment, contribution to foreign exchange and to gross domestic production.

The average payout to the Kenya farmers is easily the highest in the world, and the farmer pockets about 80% of the export prices of coffee.

As an important cash crop, coffee forms a high proportion of the total marketable agricultural production, that is about 25%. It is the highest single foreign exchange earner for Kenya and has maintained this position for a considerable time.

EMPLOYMENT SCENARIO

Coffee industry is the largest single employer. This employment is concentrated in large scale plantations, peasant holdings and processing factories. It is very difficult to ascertain the total numbers employed in the coffee industry because such a breakdown is not attempted by the statistical abstracts.

According to the survey done in 1964, the total number of employees excluding self-employed

peasant farmers was estimated as.⁷⁴

On plantations	50,000	50,000
On peasant holdings		40,000
In processing facilities		<u>3,000</u>
		93,000

The current figure is estimated to be about 200,000 employees. The total number of people dependent on coffee is far higher than this figure of employment shows.

Coffee industry, like any other agro-industry, is labour intensive. The planting, weeding and the picking of coffee have not yet been mechanized and this is impracticable presently. So much labour is needed, and used at this stage. However, the heavy intensity of labour use and the seasonal nature of the industry mean very critical problems of adjustment of labour to the level that is economic. During the coffee picking period, there are plenty of employment opportunities either in farm or factory levels. The opportunities benefit the rural population neighbouring these opportunity areas.

The coffee industry forms a substantial proportion of the Gross Domestic product of this country.

74. G.Z. Ogwang' - The Coffee Industry in Kenya, 1978.

MANAGEMENT AND MARKETING

Coffee industry in Kenya is carried by smallholder families and large plantations. Management of smallholders is centred around fairly large pulperies managed by cooperatives to which all small scale growers must belong. By installation of central pulperies and preparation centres, smallholders are given careful instructions and aided in every way possible. Every coffee grower is registered, and every grower must conform to the proper standards of cultivation, preparation and pests control.

The cooperatives own all coffee factories through which the smallholder coffee is processed and also they handle the marketing of coffee to the Kenya Coffee and Marketing Board.

COFFEE INDUSTRY: A CASE STUDY OF MERU

The importance of coffee industry in Meru cannot be overemphasized. It is by far the most important single cash crop and export commodity. It ranks first in the district.

Today, coffee industry is the largest employer. The employment is concentrated in peasant smallholdings and processing factories. It should be noted that there are no large scale plantations of coffee

in the district. Total employment numbers in the coffee industry is difficult to ascertain except in processing factories.

By 1984, the total area under coffee crop was 34,581 hectares; and in the same year, the production was 11,740 metric tonnes. The average payment to the farmers was about 85 percent of export prices.

COFFEE FACTORIES

The district has more than 200 coffee factories which are distributed in the areas where coffee is grown. They are all over district except Tharaka Division. The factories are strategically located in order to serve the small scale farmers conveniently and efficiently.

Due to the kind of primary processing they engage in you will find that they are normally located in coffee growing areas. They process the product which is bulky and more less perishable in nature. They are raw material orientated.

The first and foremost prerequisite for any processing enterprise is, of course, an adequate supply of raw materials, efficient marketing channels, power labour and water. According to the industrial location theories; an industry can either be market-oriented,

labour-oriented or raw-material oriented. The coffee factory is a typical example of raw-material oriented enterprise.

In terms of employment in the factories, they employed well over 3000 persons either as regular or casual workers.

In order to assess the importance of coffee industry to the rural economy, a sample of 20 coffee factories was drawn as a case study.

COFFEE PROCESSING:

A coffee factory is an agricultural food processing enterprise, though at a very primary stage. The processing operation involves the removal of the Outer cover of the coffee berry; after which the beans are spread to dry. After the beans have dried they are put into bags of fifty kilograms each and stored.

The transshipment of coffee beans to K.P.C.U. godowns is done thereafter. In our case, the K.P.C.U. godowns (warehouses) are located in Meru town. This is where coffee beans are stored after they have been brought from different factories. From the K.P.C.U. godowns, the beans are transported to K.P.C.U. mills in Nairobi. Needless to say at the

stage of coffee processing many people are employed (operating machines, washing coffee, drying, bagging and loading to the lorries) although they earn very little. From this it is evident that coffee industry is labour-intensive at factory level. It creates employment for the people neighbouring the factory.

An average coffee factory has a daily capacity in take of 45,000 kilograms of unpulped coffee; and an output of approximately 30,000 kilograms of clean beans.

EMPLOYMENT AND INCOME LEVELS

Today, well over three thousand people are employed in coffee factories. They are either regular or casual employees. Employment in the factories can be seen to provide livelihood for the people directly or indirectly. Albeit the incomes are low in various categories of employment, it can be generally assumed that significant proportion of the income is repatriated to the rural areas.

The two hundred factories employ about 3000 workers, and a further increase in the future could help to raise the rural incomes and the standards of living. At present casual workers are paid wages per day whereas, the permanent employees earn between 500 and 800 Kenya Shillings per month.

The sample of twenty factories taken employed 513 persons, majority of whom were casual labourers (73.3%). They were paid 2 million K. shillings per annum, in form of salaries and/or wages. One worker got an average of 3,700 Kenya Shillings per annum. It is assumed that all the money was repatriated to the rural areas to the families of the employees. Also it is essential to note that there was no worker who came from outside the district. It is therefore clear that there was no money which leaked out of the district. The salaries/wages paid to workers was ploughed into the rural areas.

TRANSPORTATION

The farmers deliver the crop to the factory. Very few farmers used the motor vehicles.

Consequently, the majority (85%) of factories hired lorries to transport dried coffee beans to K.P.C.U. godowns in Meru Town. Only 15 percent had privately owned means of transport. However, the condition of roads in the area is pathetic. The coffee roads are impassable during "flush" seasons. It grieves the farmers exceedingly that roads have been neglected by the County Council despite the cess they continued to pay. In 1983/84 the County Council cess from coffee pool was well over 12.1 million Kenya Shillings.

Thus the most inimical forces against coffee production is the badly maintained roads in the district. Lorries can take more than a week to cover a distance of eight kilometres. The situation is more serious during the rainy seasons.

MARKETING

(a) Coffee Board of Kenya

Coffee Industry in Kenya is governed by coffee Act which is an act of parliament providing for the regulation and control of production marketing and export of coffee. The Coffee Board of Kenya carries overall implementation of the act and advisory services to the Ministry of Agriculture and Livestock Development on the Coffee Industry with special emphasis on marketing.

The Board licences coffee planters, pulpers commission agents and warehouse men. The Board classifies clean coffee for payment purposes, carries out the auction of the crop (the Kenya Coffee Auctions Limited) and regulates coffee payments to growers. All coffee is sold by the Board through the Auction system.

(b) Kenya Planters' Cooperative Union Limited (K.P.C.U.)

The K.P.C.U. is the main organisation for storing, milling and handling coffee after it has left coffee farmers. It does not buy coffee from farmers or sell it to buyers. The K.P.C.U. membership includes both coffee estates and cooperatives. It provides facilities for the safe storage of coffee in various strategic coffee growing areas which regulate supplies of unmilled coffee from the members to the K.P.C.U. mills for processing. These stores help farmers avoid undue congestion on Estates and Cooperative areas after they have harvested and prepared their coffee for sale.

K.P.C.U. warehouses are generally transit stores used to serve farmers according to both their need and convenience and that of the mills. K.P.C.U. does not charge members for storage. One of the main functions of K.P.C.U. is coffee milling. It mills all coffee produced in the country before it can be sold.

FACTORY LEVEL

The small scale farmers deliver coffee berry to the pulping factory of a society where it is weighed. The weight obtained is used in calculating his payments. The pulping machine breaks the thick

Outer red cherry cover surrounding the actual coffee been. The resultant parchment coffee is only about 20% of the total weight of the farmers' coffee.

Parchment coffee is delivered to the K.P.C.U. processed and the resultant clean coffee is the substance of commercial value. The loss of weight due to removal of husks in clean coffee could be as high as 25%. This loss of weight is influenced by how well or poorly the crop was handled by the farmers at the pulping factories before being delivered to K.P.C.U. store.

As discussed earlier, coffee processing stage create employment opportunities to the rural population. The two hundred coffee factories employ about 3,000 workers in the district. They create employment for people neighbouring the factories. Five hundred and thirteen persons were employed in the twenty factories interviewed.

PRODUCTION AND PAYMENTS

The production of coffee is immense in the district. It is the leading cash crop and still the number one foreign exchange earner. The impact of coffee payments is felt in other economic sectors of the district. The table below shows the production

(tonnes) and payments (K£) for a period of 4 years in the district.

TABLE 26: COFFEE PRODUCTION

Year	Production (Tonnes)	Payments (K£)
1980/81	13,305	14,191,113
1981/82	12,298	17,097,172
1982/83	10,088	17,597,911
1983/84	11,740	21,515,663

Source: C.B.K. Annual Report, 1983/84.

The payments to planters on cash availability are kept regular and reasonable rates of adjustment. Payments are made in five interims. Of the 4 years, 1980/81 recorded the highest volume of coffee produced and handled in Meru.

In 1983/84 crop year Meru district realized 117,40,401 kilograms of clean coffee and Mbuni. This brought into the district K£ 20 million. The interview revealed that the twenty factories had sales to the tune of 38.9 million shillings which was made from 10.1 million kilograms of coffee sold. The small scale growers received 80% of the export prices .

Assumingly, the money was used in the rural areas with minimal leakage.

BASIC INFRASTRUCTURE:

ROADS:

Good roads facilitate faster transportation of coffee from the factories to the K.P.C.U. godowns in Meru Town. The coffee factories are dispersed over a wide geographical areas where coffee is grown. Hence coffee roads need to be maintained to ease the marketing of agricultural produce.

One can see that the level of road development in coffee zone is very low. The roads are impassable during "flush" seasons. Hundred percent of the factories claimed that the coffee roads were moving from bad to worse. They castigated the County Council for their unconcerned attitudes toward rectifying the situation.

ENERGY:

Electricity is vital for the maintenance of coffee factories. Incidentally; it is poorly provided. Only one factory which constituted 5 percent had electricity. The factory consumes an average of 226. K.V.A. per month.

Ninety five percent did not have electricity. However, the factories expressed desire to have electricity for lighting and drying coffee beans during flush seasons. From this evidence, it is clear that coffee industry has not contributed to the process of rural electrification.

TELEPHONE SERVICES

Telephone services are equally important . They make the communication between the Union and the Societies very easy. The society wanting to transport its dried coffee beans can communicate to the Union Headquarters without much ado.

Surprisingly, only 2 factories had telephone services, the two factories happened to be near designated service centres. The ones which did not have expressed the desire to have these services. It is evident that coffee factories have not aided the installation of telephone services in the rural homesteads.

PROMOTION OF OTHER ACTIVITIES

Needless to say, coffee industry has boosted many other activities in the rural areas. The coffee roads programmes has helped to improve marketing of agricultural products. Also the quality of rural housing has improved tremendously due to increased rural incomes.

Many rural projects have been implemented: water projects, cattle dips, schools, dispensaries etc. The projects can be associated with good payments from coffee industry. This is the money which is ploughed back to the rural areas.

Therefore it can be concluded that the contribution of coffee industry to the process of rural development is undoubtedly conspicuous. Its impact can be seen with our naked eyes. This can be seen in such areas like employment, rural incomes, basic infrastructure and promotion of other activities in the rural economy.

3.2.2.2. TEA INDUSTRY

The development of tea has resulted in the redistribution of incomes by creation of new productive capacity in many parts of the country. It is providing meaningful, year round, employment to thousands of farmers on their own farms; regular wage employment to farmers' sons and daughters in modern but rural factories, collection and transport network. Tea is indeed a labour intensive crop. This is recognised in all the standard works on tea cultivation and on the management of tea estates. Only in Russia, and to a lesser extent in Japan has there been much success in mechanizing tea harvesting operations. East Africa, as with the major tea

producing countries of India and Ceylon continues to rely on manual labour for most field operations in tea production.

The area under tea in Kenya is to the tune of 26,173 hectares and the total number of growers are 149,555.⁷⁵ From this one can contend that the growers are self-employed on their farms. Meru has 6,557 hectares under tea crop and 17,0003 growers.

There are thirty eight K.T.D.A. tea factory companies in operation. They employ well over 3,800 people. The factories received 208,489,880 kilograms of green leaf from which they processed 49,633,000 kilograms of made tea in 1984, compared to 200,955,000 kilograms of green leaf received and 46,305,000 kgs. of made produced in 1983.⁷⁶ It is clear that tea industry is doing well.

The total payment to all the smallholder tea growers in 1984 was 1.5 billion K. shillings. This was the highest payment in the history of K.T.D.A. Thus money had a major and positive development effect in the rural areas, not only where tea is grown, but also in the other sectors of the national economy.

75. K.T.D.A. - Annual Report and Statement of Accounts 1983-84

76. Ibid.

TEA PROCESSING

There are many methods of tea manufacture used all over the world depending on the type of made tea that is to be produced. The processing method is the cutting, tearing and curling (C.T.C.) method in order to produce Black tea. The green leaf is spread on long troughs called tats and air, which can be heated necessary and air is passed over and through the tats for a period of up to 18 hours. This process is called withering and the aim is to evaporate excess moisture and leaf flaccid.

The leaf then comes into the C.T.C. machine where it is cut and rolled. The cutting ruptures the cells and releases the juices and spreads them over the surface, the rolling forms the tea into tiny balls.

After tea has been processed it is packed into modern chests lined with alluminium foil to prevent deterioration and are then ready for export. The locally consumed teas are packed into bags and sent to the Kenya Tea Packers (KETEPA) factory at Kericho for blending and packaging for the local market. From this it is evident that tea industry even at factory-level is labour intensive. Needless to say, it has a role to play in employment creation and income generation in the rural areas.

TEA INDUSTRY: CASE STUDY OF MERU

The importance of tea industry in Meru cannot be over-emphasized. It is the second cash crop in income earning. The area under tea in the district is to the tune of 6,557 hectares and the total number of growers are 17,003. The total yield per hectare was 2,925 Kgs/hectares in 1984.⁷⁷ Thus at farm level, there were 17,003 people who were directly self-employed.

The district has four K.T.D.A. Tea Factory companies in operation; Githongo, Kiegoi, Kinoro and Imenti. The four factories employ about 300 people.

GITHONGO TEA FACTORY:

In an attempt to assess the role of tea industry in the process of rural development Githongo Tea factory was chosen as a case study.

Githongo Tea factory is among the four factories presently in operation in the district. The smallholder tea farmers who deliver tea to the factory are shareholders. Growth of Githongo tea factory in the early 1970's was necessitated by the increased output of tea in the area and in order to relieve congestion in the other two factories which existed by then, Kinoro Tea Factory was opened in 1984. Githongo factory

77. Meru District Annual Report, 1984, Min. of Agriculture And L. Devt.

has a daily capacity intake of 45,000 kilograms of green tea leaf, and an output of 25,000 kilograms of made tea.

EMPLOYMENT STRUCTURE:

Organizationally, the employment structure of factories can be divided into the managerial and technical aspects. The technical aspects predominate as observed by the number of people employed in this sector of the factories compared to management. Out of the total permanent establishment of hundred in the factory, only 8 were in managerial and clerical positions. These included supervisors, senior clerks, assistant manager and the manager.

About 92 percent of the workers were semi-skilled or unskilled workers with none having attended post-secondary institution. Most of the workers were C.P.E. and form two graduates who have been taught through on-the-job training. The majority were in the major stages of tea manufacture; spreading, withering, cutting fermenting, drying, soveting and packing.

The factory help in creating employment in the rural areas for people who would otherwise be unemployed for lack of skills. In addition to

that the factory employ casual labourers particularly during the "flush" season when the crop increases considerably. Also the factory employ casual labourers to cut firewood in the forest. The factory uses woodfuel in tea processing; and electricity for lighting only.

Bearing in the mind the pressure on land that exists in the district, the employment created in the factory is quite a relief on the district. Between them, the four tea factories in the district employ some 300 persons and if one adds their dependents the figure would come to nearly 1500 people directly dependent on the factories.

Further one can assume that factory workers employ labourers on their landholdings and therefore also create employment and incomes. There are also those employed in the leaf bases attached to the factories for purposes of transporting green leaf to the factories. The employment created by the factories either directly or indirectly is still very small, and more so, when compared with the total district population.

In Githongo tea factory 95% of the operatives came from the district and therefore one can contend that the largest share of the benefits of employment in the factory accrue to the district. Only 5% of the

total workers in the factory came from outside the district. Thus the benefits are not only confined to the district but permeate into other areas of the country as well.

INCOME GENERATION AND INCOME LEVELS:

In terms of income generation, the employment in the factories can be seen to provide livelihood for the people directly or indirectly involved in the factories. Though the income levels are low in the various categories of technical employment, it can generally be assumed that a significant proportion of the income is repatriated to the families of the employees. This may be in the form of cash or other tangible goods. Because of the low income of factory workers, the amount repatriated is normally small.

The four factories in the district employ about 300 persons and a further increase in the future could help in raising the incomes and employment levels in the district. At present casual workers are paid wages per day while the other permanent workers can be assumed to earn between 300 and 600 Kenya shillings per month. With the present inflation rate, this is a low figure and a rise in incomes could go along way towards raising the standards of living of the employees and their dependents, and contribute significantly to the rural economy.

The workers of Githongo tea factory were paid salaries/wages to the tune of 60,000 Kenya shillings per annum. All this (assumably) was ploughed back to the rural areas; where it is normally used in rural projects. On the other hand, the amount paid to the five percent who came from outside the district amounted to 36,000 Kenya shillings. The five percent were the highly paid cadres - manager, assistant manager and the clerks.

FORWARD LINKAGE

Needless to say, the forward linkage in tea industry is very weak. What is produced from the factories is for all purposes a finished product, and does not allow any further processing. Except for blending and packaging of the product to the consumers, the possibility of existence of other manufacturing activities is non-existent.

MARKETING:

The packaging is seen in two perspectives: packaging for export and packaging for the local market. Packaging for the export is done in the processing factories themselves and this create employment in the rural economy in areas neighbouring the factory. The finished product has to be transported to Mombasa for export overseas. All this creates a

chain of employment and incomes in various sectors of the economy. Packaging for local consumption is done at KETEPA factory at Kericho. Also the low quality made tea is put into polythene papers and sold to smallholders at subsidized prices.

After packaging tea is sold overseas either at Mombasa or the London auctions and therefore can be said to gain the country foreign exchange. Out of the made tea of Githongo factory about 90% is sold overseas.

Sale for local consumption fall into three categories. The factory deliver about 9% of their output to KETEPA for packaging and distribution to local consumers in the country. About 1.05 of the total production from the factory is sold to private local large scale purchasers such as institutions. The remaining 0.05% is sold to growers at a subsidized price.

BUYING CENTRES:

The linkage structure between the farm and the factory is strong. It involves the marketing of the green leaf through the buying centres and its delivery to the factories. Hence the function of leaf bases as the coordinating bodies in this operation are worth discussion.

K.T.D.A. leaf bases are located at every factory to coordinate the collection of green leaf from farmers and deliver it to the factory which buys it from the K.T.D.A. Thus the buying centres are run by the leaf bases under which they fall and which supply them with leaf collectors and lorries to transport the green leaf. The bases are under the direction of a leaf officer in charge of all operational staff involved in collecting green leaf.

DISTRIBUTION OF BUYING CENTRES

In order that the green leaf reaches the factory with the least damage and thus as fast as possible; the location of buying centres are supposed to be as convenient for the farmers as possible. A farmer is supposed to walk for two kilometres or less to deliver his green leaf. So the buying centres are strategically and conveniently located. Also the location of a buying centre in a particular area is also dependent upon the amount of green leaf produced. Ideally an area qualifies to have a buying centre if it produces a minimum of 2700 kilograms of green leaf per day.

TRANSPORTATION:

The majority of the growers carry tea baskets on their shoulders or heads to deliver to the buying centres. A small percentage used bicycles, wheelbarrows and motor vehicles.

When it is bought by the K.T.D.A. it is the responsibility of this body to deliver the green leaf to the factories. Transportation of tea is a difficult process that must ensure that the tea reaches the factory as soon as possible, and that the leaf is not damaged during transportation. In order to deliver the leaf intact and in good condition, it is packed in a loosely knit sisal bags and loaded into specially fitted lorry that allows a semblance of the withering process to take place as the tea is taken to the factory.

However, the major problem encountered in the transportation of green leaf from the buying centres to the factory is impassable roads specially during "flush" periods. The cost of K.T.D.A. field operations that, is, leaf collection, in particular are increasing faster than the growth in income and crop. The situation is more serious in Igembe division of Meru. In 1984, the manager of K.T.D.A. said:

"The tea roads in all the tea areas have gone from bad to worse over the years. The expected tea roads rehabilitation programme has not taken off at all. The situation is in particular very desperate in Igembe division of Meru district where the Authority is faced with a grave transport problem all over the country. The once murramed earth roads have had all the

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murram washed away thereby becoming impassable by the bedford J. six lorries used by the authority."78

It is clear that tea roads are impassable during "flush" periods and unless urgent measures are taken to improve the roads alternative means of transport has to be sought.

EMPLOYMENT.

The leaf collection machinery is also a significant employer of labour. Githongo Tea factory employs many staff as drivers, leaf collectors, and several mechanics and off loaders. In addition to people employed in the factories, the tea industry provides off-farm employment to a significant number of people in the survey area.

Incomes are low and do not allow significant savings. Leaf collectors earn an average of 400 Kenya shillings and the rest of the leaf base staff earn much less. A driver earns an average of 450 Kshs. per month. The absorption of these people into gainful employment has reduced unemployment, in addition to raising incomes and living standards in the rural areas.

INFRASTRUCTURE:

ROADS:

Good roads facilitate faster transportation of tea to the factories. Unlike tea plantations, shareholders are dispersed over a wide geographical area. Hence the tea zones need good roads to ease transportation, that is transporting green leaf from the buying centres to the factories, and transporting packaged made tea from the factory to the final destinations.

One can see that road development is a major instrument of economic development. The tea roads have encouraged the growth of agriculture in the tea zone in general. The existence of a good roadnetwork system is essential for agricultural marketing, and more so, for tea which is perishable than most other cash crops.

ENERGY (ELECTRICITY):

Supply of electricity is essential for the manufacture of tea. All the tea factories in Meru district are supplied with electricity from the National Grid System. Unfortunately, the distribution of electricity to factories has not aided in the process of rural electrification in the district. One can find institutions, schools, health units which are near tea

factories and do not have electricity at all. The cables may have passed above the school compound. Thus tea industry has contributed very little (if any) to the process of rural electrification.

PROMOTION OF OTHER ACTIVITIES

The tea roads programme as a supplement to the existing infrastructural facilities has helped the improvement of agricultural marketing especially the development of horticultural crops like cabbages, tomatoes, carrots and even keeping exotic cattle. Although the condition of the tea roads is not adequately good, they have been instrumental in the transformation of the agricultural practices in the district.

In summary, the role of tea industry in Meru district can be seen with our naked eyes. This is in the areas of employment creation, increase in incomes, and the provision of basic infrastructure. However, it is essential to note that the condition of tea roads in the area is pathetic. There is need to tarmac some sections of the roads to ease transportation.

3.2.2.3. MAIZE:

There exists several posho mills distributed all over the district. Some are located in service centres

where they have access to electricity; and others along the river banks where they use the water power. However, this discussion would not dwell on the posho mills, but the Meru Union maize mill which is located in Meru town. Although the posho mills play a vital role in providing employment to owners and few other assistants, they will not be discussed.

MERU UNION MAIZE MILL

The milling method used in Meru Central Farmers' Union Maize mill, and indeed most maize mills in Kenya, are similar in methods. They produce Unga (four). Thus the Mill processes one of the most essential staple food in the district (maize). The mill was installed by Meru Union at a cost of 15 million shillings. The flour produced is either consumed in the district or sold outside to other districts.

The mill stand on 1.6 hectare plot which according to the manager was not enough. It has an intake capacity of 750,000 kilograms of maize; and an output of 150,000 kilograms of flour per day. However, a maize mill does not exist without an animal feed firm which produces feedstuffs for cattle, pigs, chicken etc. thus the mill has an animal feed industry.

EMPLOYMENT STRUCTURE

The employment structure of the mill can be divided into managerial and technical aspects. The technical aspects, as it were, predominates as observed by the number of people employed in this sector of the mill compared to management. Out of the total permanent employees of sixty one people, only (19) nineteen were in managerial and clerical positions. These include among others the manager, assistant managers, accountant, senior clerks, supervisors etc.

Thus about 70% of the workers were semi skilled or unskilled workers with none having attended post-secondary school institutions. Most of these were C.P.E. graduates. Majority were in the major stages of Unga packaging.

Needless to say, the mill help in creating employment in the rural areas for the youths who would otherwise be unemployed and looking for jobs in urban areas without blessing. Also the employment in the mill reduces to a very small extent, the pressure on land in the rural areas.

In the mill, 98.4% of the workers came from the district; and therefore one can contend that the largest share of the benefits of employment in the mill accrue to the district. Only one person came from outside the district.

INCOMES

Employment in the mill can be seen to provide livelihood for the people in the firm. It is also assumed that a significant proportion of the income got as salaries/wages is repatriated to the families of the employees. The firm employs about sixty one persons. A further increase in the number of employees could help to raise the rural incomes and employment levels in the district. Also it employs as many casual workers as sixty two people who are paid wages on daily basis. The permanent workers are paid salaries at the end of the month.

The workers of the enterprise were paid salaries/wages totalling to 1.5 million shillings per annum. Surely, this was a substantial amount of money which was repatriated to the rural areas. Only 36,000 Kenya shillings per annum was paid to the worker who came from outside the district. This means that other districts benefitted from the mill in terms of employment opportunities and incomes.

BUYING OF MAIZE

The linkage structure between the maize farmers and the maize mill is rather weak. Actually it involves selling of maize to the National Cereals and produce Board which in turn sells to the millers. Thus the contact (direct) between the mill and the

smallholder farms is rather intermediary in nature. Thus the Board is the sole buyer of maize from farmers. However, formerly, the mill used to buy maize directly from the farmers at a throw away price until the government intervened.

Today, it is only National cereals and Produce Board which is licensed to purchase maize from the farmers. Nonetheless the pricing system of the produce is not encouraging to the farmers. The Board's storage facilities are located in Meru Town. This is where the mill gets maize from. Due to shortages at times it gets maize as far away as Sagana Depot.

MARKETING:

After the flour (Unga) has been put into packets of 2 kilograms each, it is sold to local wholesalers who alternatively sell to retailers and, then to local consumers. Packaging is done in the factory. This create employment in the rural economy in the areas neighbouring the maize mill.

According to the Manager of the plant, 50 percent of the output from the plant is consumed in the district; whereas, the other half is sold outside the district. The main consumer district are: Isiolo, Marsabit and Embu; to mention a few.

The other by-product from the plant is animal feeds for pigs chicken and cattle. Much of this animal feedstuffs are sent to Embu.

TRANSPORTATION:

As far as transportation was concerned, the maize mill did not have transportation problem: In fact, the mill is located in Meru town where it has good accessibility in terms roadnetWorks. To get maize from the Depot it uses union lorries and sometimes the railway trucks. In the process of off-loading and loading of maize many people are employed as casual workers, although the incomes got are low and do not allow significant savings. In fact, much of this money end up in bars and their luxuries.

It is evident that these are off-farm activities which have tended to reduce unemployment, though these are seasonal in nature.

INFRASTRUCTURE:

The impact of maize mill on infrastructural development in the neighbouring areas has remained minimal. In fact the best word to use is that they are "absent". One would argue that good roads are necessary to facilitate faster transportation of maize to the milling plant. In this case maize is

got only from the National Cereal and Produce Board depots which happen to be located in designated centres. The milling plant does not bother with the rural access roads.

Consequently, the National Cereals and Produce Board has done very negligible work to improve the rural access roads. But may be it is because the farmers are forced to deliver their grains to the nearest centre. Hence the Board has had no opportunity to penetrate into the hinterland.

Summarily, the role of maize mill in the process of rural development may be seen in the areas of employment creation, incomes generation and provision of goods (AFYA UNGA); animal feeds etc. to the rural population. However, the plant faces many problems/constraints like shortage of maize and water, poor management and other political associated problems.

3.2.2.4. TIMBER INDUSTRY

Forests in Kenya are publicly owned and are administered by the Forest Department. The Department is charged with the responsibility of developing and protecting all the gazetted forests in country only.

The gazetted forests in Kenya cover only 3 percent of the total land area and amount to 1,700,000 hectares. Of this plantations (man-made forests) amount to 142,000 hectares and annual planting programme is 6,600 hectares.⁷⁹

SAWMILLING EQUIPMENT AND TECHNIQUES:

The majority of saw mills in Kenya ^{use} the circular saw milling machines. A handful use handsaws. A few sawmills use framesaws and edgers. A basic machinery combination is usually a circular heading two circular bench resaws and a cross-cut with an electric component.

Logging equipment consist of a chain saw for felling trees, agricultural tractors for skidding logs to roadside, tractor and trailer or flat-bodied lorries for transporting logs to the sawmill a yard. Loading is generally done manually; a few saw mills in Kenya use mechanical log loaders.

Saw milling techniques followed by most saw miller is simple but slow and results in low production. Loading of logs on the decks in most saw mills is done manually; a few mills use winches overhead gantries and front end loaders. From the log-deck logs are

79. Planning of Saw milling Industry in Africa - Seminar on Planning of Sawmilling - 1978.

rolled on to the log carriage manually. Logs mounted on the carriages are fed through the headrig which produces large boards and cants. Headrigs do not produce finished timber. Cants or boards from heading are normally transported to the resaws over dead rollers or wooden table. Resaw produce timber of various sizes which are trimmed as necessary and stocked manually in packets of timber of varied length but one size.

Very few sawmills have waste extraction equipment. The average production is 4,000 m³ per year with the largest sawmills producing up to 16000 m³.

EMPLOYMENT:

From the above explanation, it is clear that timber industry is labour-intensive. It creates employment opportunities for the people neighbouring the industry. In the logging stage, 6.2% of the costs are paid in form of salaries and wages. This amount is paid to casual labourers who are employed to fell trees and cut them into sizeable and manageable logs ready for transportation to the mill. The employed workers do also the loading and off-loading of logs.

On the other hand, in the conversion stage, (Sawmilling), 14.5% of the total costs is paid to workers in form wages/salaries. Thus, all in all,

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the two stages of timber industry take 20.7% of the total costs in form of salaries/wages. This reveals that timber industry is labour intensive and not capital-intensive.

An average sawmill in Kenya is run by a manager assisted by two or three foremen, a sawdoctor, an electrician (if the mill is electrical) two to the three mechanics and a millright four clerks, few sawyers and not less than 30 workers.⁸⁰ Approximately 30,000 persons are engaged in forest exploitation and saw milling industry; where the industry ranges from pit-sawing upto mills with a raw material input of several hundred thousand cubic metres per year.

RAW MATERIAL SITUATION

Most of the exploitable timber is from plantation forests consisting of coniferous softwoods, that is, cupress and pines.

Apart from the plantation species sawmills exploit logs from indigenous forests. There are many species but only twenty five are normally considered by saw millers. The most valuable indigenous species are: cedar, podo, camphor and Meru Oak.

The total log intake by saw mills in Kenya is about 520,000 m³ annually and about 85 percent of this

80. Ibid.

comes from plantation forests. At present the forest department can supply enough to all licensed saw mills in the country. However, of late, quite a number of licences have been withdrawn. This is in accordance with the government directive that forests clearance should be minimal in order to conserve the environment and water catchment areas.

TIMBER INDUSTRY IN MERU

Meru district has more than eight saw mills, twenty one saw benches and sixty two pitsawyers. They are found in all divisions except Tharaka. All sawmills are privately owned either by cooperatives or individuals. The eight saw mills or so, exploit gazetted forests under government licences. The forest department issues long term licences and short term licences annually to sawmillers. Currently, the operation of licenzing is minimal. Many small sawmills operate by obtaining logs from private forests and farms.

The industry employ approximately 800 workers. majority of them are pit sawyers (310) followed by 278 who were employed in the saw mills as at 1982.⁸¹ This shows that each sawmill had an average of 35 workers.

81. Meru District Development Plan 1984-88, Government Printer.

WASON TIMBER AND NJERU INDUSTRIES

In an attempt to assess what role timber industry play in the creation of employment and incomes, two sawmilling industry were chosen as case studies: The Njeru industries and Wason timber Co. Limited. These two are among the eight sawmills in the district.

One begins from the sawmill as the central unit within the overall activities of sawmilling industry and then one gauges the backward linkage, in form of inputs to the industry (labour, raw material etc) and forward linkage. The forward linkage is seen as those activities which are set in motion by the further processing or sale of the finished products. The scope of this paper is less concerned with the forward linkage. The assessment of backward and forward linkages helps one to understand and appreciate the impact of sawmilling industry to the rural economy.

SAWMILLING EQUIPMENT AND RAW MATERIAL SITUATION

Like majority of sawmills in Kenya, Njeru and Wason Timber industries use circular sawmilling machines.

They derived their raw material from the plantation forests which consist of coniferous soft woods cypress and pines. Also they obtained logs from private forests and farms. Hence shortage of raw material was experienced in both industries.

Logging equipment in the forest consisted of a chain saw for felling trees, and then tractors, trailers and flat bodied lorries were used for transporting logs to the saw mills. This stage employed many young people of the neighbouring area.

EMPLOYMENT AND INCOMES:

Both Njeru and Watson Timber industries employed sixty four persons. Of this, 16 held managerial and/or supervisory positions, and forty eight of them did technical work in the industries. The technical workers included electricians, mechanics, millright, sawyers and others. Also only 5 workers came from outside the district; all the rest 59 were from the district. From this evidence, one can contend that majority of the workers employed in sawmilling industries come from the district, hence they benefit more in terms of employment opportunities.

Conversely, all the workers employed in the two industries earned to the tune of 792,000 Kenya shillings in form of salaries/wages per year. Of this, only 36,000 Kshs. was paid to the workers from outside the district. The seven hundred fifty six thousand shillings went to workers from the district. Needless to say, this amount is repatriated to the rural areas.

The money is utilised by the families of the workers; and assumingly very little amount leaks out of district.

The benefits of saw milling industries did not accrue to only Merians, but also outsiders. Wason Timber Industry employed 50 workers, and five of them were from outside the district. Infact they were the best paid cadres.

MARKETING :

The interview with the two sawmilling industries alled that they had no problem with marketing finished timber. Sixty percent of the output sold on retail basis in the district. The major yers were the builders and informal cottage ndustries - carpenters. Over 40% was sold on wholesale basis. This was sent to places like Mombasa, Nairobi etc.; on order.

Njeru industries in 1985 made sales of 1.68 million Kshs. out of 70,000 kilograms of ready timber. Assumingly, much of this money was ploughed to the rural areas. Also it was the same money which was s used to pay salaries and wages to the workers.

OTHER BENEFITS:

In addition to creation of employment opportunities, the sawmilling industries offer other benefits to the rural population.

The sawmilling industries have maintained the main forest roads which they use to collect logs. The same roads are used by rural population to collect firewood from the forest. Wood is the major source of fuel in the rural areas.

Also the people are allowed to collect slabs and saw dust from the saw mill yards which they use as firewood. The saw dust is also used in buses and houses (hotels) to prevent the spread of mud in the premises during the "flush" seasons.

As discussed earlier, the industries purchase logs from private forests and farms. From this evidence, it is true that people with private forests get cash from the saw millers after selling their logs.

PROBLEMS

The problem identified by the managers of both sawmilling industries was recent. The major, and the only problem was shortage of logs. This problem cropped in due to the Presidential directive that the forests should be safeguarded for their importance

as water catchment areas.

CONCLUSION

The importance of timber industry cannot be over-emphasized. The industry ranges from pitsawyers upto a mill consuming several thousand cubic of meters of logs per year. The industry provides employment opportunities, generate incomes, in addition to, goods and services to the rural population. The pitsawyers provide finished timber to rural people who may require them for building and other purposes. The sawmills allow the rural people to collect slabs and sawdust which they use as source of fuel.

3.2.2.5. COTTON INDUSTRY

There are a large number of districts in Kenya that grow cotton. The following are the major cotton growing districts: Bungoma, Baringo, Busia, Kakamega, Siaya, Kisumu, South Nyanza, Meru, Kirinyaga, Embu, Murang'a, Kitui, Machakos, Tana River, Lamu Kilifi and Taita. The significance of cotton, however, depends not so much on the value of its total production which is small in relation to many agricultural products as upon the increasing demand of its products by the local textile industries.

Cotton is one of the agricultural commodities through which the country earns foreign exchange, in addition to providing employment opportunities.

Foreign exchange earnings are means of purchasing imports required for economic development. Meru district which is the area chosen for this study contributed 3844.0 metric tonnes in 1983/84 as opposed to 2160 tonnes (1980/81). The production has fluctuated over a number of years. However, there is need to substantially increase domestic cotton output in the district, and the whole country at large.

Cotton makes a considerable contribution to meet the smallholders' cash obligations. In 1957 about 29%^q of the Nation's Gross Farm Revenue Originated from cotton, while in 1965 the proportion of G.F.R. emanating from this crop represented 4.4% of the total G.F.R. from all cash crops. Between 1954 and 1972 total Gross Farm Revenue originating from the small farm cash crops rose from about Kshs. 10 million to 55 million Kshs., that is from 26.8% to 51.6% of the total agricultural produce (Davis, 1977).

Cotton contributes to farm incomes and also provides productive employment for large scale of the community in Kenya. Unfortunately, it is difficult to ascertain the numbers employed in cotton industry because the statistical abstracts do not have them.

Nonetheless, cotton industry is labour-intensive. It creates employment opportunities for the rural people at different stages. It is worthwhile to note that the industry ranges from the farm level, through ginning and textile mills up to fabrication; when a cloth is manufactured into an item ready for consumption. Each and every stage is labour-intensive, and creates employment for the people neighbouring the industry. Thus the activities of cotton industry affect the national economy at so many points that it is difficult to make a precise assessment of its value.

COTTON INDUSTRY: A CASE STUDY OF COTTON GINNING INDUSTRY IN MERU

Cotton is one of the major cash crops of Meru district earning her a considerable part of much needed foreign exchange, in addition to providing employment opportunities for the rural population. It is increasing total agricultural output as a contribution to the overall economic growth and improving the incomes and standards of living of many people in these areas.

The main growing areas are chaaria-Gaitu one. Cotton is grown on an individual basis. As such all cotton is peasant grown and there are no large estates in the district. In 1984, there were 1200 small scale growers who had planted 22,000 hectares with cotton. From this, one can argue that 1200

smallholding growers were directly employed on farm activities. The farmers, also employ workers to assist them in the farms: clearing/burning land, digging, sowing, weeding/thinning, picking and cotton (grading) selection. It is clear that cotton industry provide employment all the year round.

MERU COTTON GINNERY:

Usually the farmers deliver their cotton to the buying posts. The buying posts are conveniently located to serve the farmers efficiently. After it has been delivered it is collected by the company's lorry which deliver cotton to the ginnery ready for processing.

Raw cotton as it is received by the ginners consist of a tightly packed mass of fibres and the processes of ginning consist of loosening the mass of the fibres and removing the heavier forms of dirt.

cotton lint is collected by textile industries (Nanyuki, Nyeri etc.) and seeds are collected by manufacturers of salad oils, soap, animal feeds etc.

Until 1985, Meru Cotton Ginnery had 20 gins. Today it has 30 gins. The industry has a ginning capacity of 10,000 bales per year. The ginning

industry is located in cotton growing zone (medium potential area).

RAW MATERIAL SITUATION:

The ginnery draws its raw material from the district. The area grows alot of cotton such that the surplus is sent to Mwea ginnery in Kirinyaga district. In 1985/86 crop year, they sent out 3 million kilograms to Mwea ginnery. It is clear that the district has a potential for an extra ginnery.

The total intake by the existing ginnery is about 10.1 million kilograms annually. The daily output is about 50 bales.

EMPLOYMENT AND INCOMES

Organizationally, the employment structure of cotton ginning industry can be divided into managerial and mannual (operatives) aspects.

The manual workers predominate as seen by the number of people employed in this sectors of the ginnery compared to management cadres. Out of three hundred total permanent establishment in the ginnery, only 25 (8.3%) were skilled. These held managerial, clerical and supervisory positions.

Ninety one percent of the workers were semi-skilled, or unskilled. Most of the workers had gone up to form four; although they did not have any professional training. Most of these unskilled workers were in the major manual stages of the processing.

Needless to say, the cotton ginning industries help in creating employment opportunities in the rural areas. Additionally, the industry (ginners) employ casual labourers especially when the cotton production is high in the district.

In Meru Cotton Ginnery 99.3 percent of the workers came from the district and therefore one can argue that the largest share of employment benefits in the ginnery accrue to the district. Only 0.7% of the total workers came from outside the district. Hence the benefits are not confined to the district but leaked out into other areas.

In terms of incomes generation, the employment in the ginnery can be seen to provide livelihood for the people directly or indirectly involved in the ginnery. The workers (300) were paid 1.2 million Kenya Shillings per year. Only 72,000 Kshs. were paid to outsiders, in form of salaries. Though the income levels are low in the various categories of manual workers, it can generally be assumed that a significant proportion is ploughed back to the rural

Also, sales in the ginnery were very encouraging. In 1983/84 crop year the ginnery made sales of 50 million Kshs. from 10 million kilograms of cotton. Assumably, the largest share of the amount went to the small scale farmers.

BASIC INFRASTRUCTURE:

ROADS:

Roads in the cotton growing areas are very poor. These roads are impassable during the rainy seasons; and dusty during dry spells. However, it should be mentioned that the roads are numerous despite their condition. From this evidence one can contend that the cotton ginnery has not aided the improvement of rural feeder roads.

ENERGY:

It is true that ginning needs energy. Meru ginnery is supplied with electricity from the national grid system via Meru Town; but it is confined to the industry. There is no institution or homestead which have benefitted from the supply. Thus rural electrification exercise has not been aided by the installation of electricity in the ginnery.

CONCLUSION:

Agriculture is the mainstay of Meru economy. And cotton is a vital agricultural commodity playing an important role in providing employment opportunities for a large number of people, contributing to export earnings, increasing total agricultural output as a contribution to the overall economic growth, improving the incomes and the standards of living of many people and supplying raw materials for textile and oil-seed processing industries.

3.2.2.6 DAIRY INDUSTRY

Before 1963, dairy development in Kenya was confined mainly to the high potential areas and the industry was invariably located in large scale farms. Since independence the situation has changed drastically. Milk is now produced in most parts of the country and small scale milk production has become the nucleus of the dairy industry in Kenya. Small scale farms are now estimated to produce about 80 per cent of all milk consumed in the country leaving 20% to the large scale farm sector.⁸²

MILK MARKETING

Large proportion of the total amount of milk produced in Kenya is retained at the farm primarily for farm family consumption and presumably for feeding to calves. Approximately, 40-50 percent of

82. The 1980, National Livestock Development Policy Paper page 32-33.

domestic production of milk is directly marketed.

The marketed milk surplus is usually handled either locally by private dealers and/or Dairy Farmers Cooperative Societies or by Kenya Cooperative Creameries Limited (K.C.C.). The K.C.C. is the buyer of the last resort in most areas. The K.C.C. serves a central role in milk marketing in Kenya. First the organisation receives milk that cannot be sold locally from the both the private number members of the K.C.C. and the Dairy Farmers' Cooperative societies. Secondly the K.C.C. is the main manufacturer of industrial dairy products in Kenya as is estimated to have about 95% share of the market.

EMPLOYMENT:

Apart from providing milk for home (family) consumption, cash income to farmers and generating foreign exchanges for the country, the milk industry is also an important emportant employe✓ of labour. Its rapid development particularly in the small scale Sector, means that more job opportunities are being found and this is of special importance to Kenya where unemployment is one of the greatest problems.

In milk industry, employment is concentrated in large scale farms peasant holdings and dairy processing plants like the Kenya Cooperative Creameries' plants.

It is difficult, however, to give the breakdown of employment figures.

The importance of milk industry cannot be overemphasized; it provides milk for family consumption. It is estimated that 50% of the milk produced by small scale farmers is consumed by families.

MILK INDUSTRY: CASE STUDY OF MERU DAIRY PLANT

Until recently most milk processed by K.C.C. plants was from the large farms. Smallholdings did not have surplus milk to sell to K.C.C. Today, there are several thousands of farmers who sell their milk to K.C.C. and other processing plants through rural based milk cooperatives. Meru district has thirteen milk cooperative societies through which the small scale farmers market their milk. The milk produced in smallholdings is sent to Meru Dairy Plant; and the surplus is taken to Kiganjo K.C.C. plant. Meru Dairy Cooperative Society decided to set up their own dairy processing facility due to the high costs they had to incur to transport their milk from Meru Town to K.C.C. dairy plant at Kiganjo. Also there were losses on the way, where sometimes milk perished before it is reached the plant.

The Dairy plant was completed in 1984 with the combined efforts of Finnish Government and the Meru

Central Union. It stands on a $\frac{1}{4}$ hectare plot, hence no room for expansion. The whole project costed 30 million Kenya shillings.

In terms of raw materials; fresh milk is the most important raw material; although polythene papers are also needed. It gets all the milk from the district. Thus the plant depends on the production from smallholdings. Conversely, the dairy plant has a daily intake of 20,000 kilograms of fresh milk; hence it cannot cope with the supply of milk from the rural areas. Much of the milk from smallholdings is sent to Kiganjo K.C.C. plant for processing. It is important also to note that milk from large scale sector is sold directly to K.C.C.

MILK DELIVERY:

Each individual small scale farmer generally produces a small volume of milk which can hardly justify direct delivery to K.C.C. plant in own transport. Therefore it becomes necessary that small scale producer do get together and form a cooperative that can handle the marketing and sales of the milk from individual members in order to obtain the benefits of the economies of large scale operation; Hence the importance of an efficient dairy farmers society cannot be overemphasized. Meru has such

thirteen Dairy Farmers Cooperation Societies which do market the milk for the small scale farmers.

Small scale farmers generally try to sell their milk locally in the neighbourhood wherever possible. They deliver whatever cannot be sold in their neighbourhood to their local Dairy Farmers Cooperative Societies. The key activities of the D.F.C.S. include the organization and management of milk collection in the rural small scale farms that they serve. Each D.F.C.S. will operate a central milk collection centre, plus several milk collection points along the designated milk collection routes within the area served by the given D.F.C.S. A well organized milk collection point may serve farmers within a neighbourhood of 2-5 km radius

A D.F.C.S. must have staff to receive milk from the farmers at each collection centre. After the milk has been weighed and put in 10 gallon cans, then the D.F.C.S. takes the responsibility of marketing this milk on the behalf of the members. In this case much of the milk is taken to Meru Dairy Plant by Cooperative land rovers.

Just like individuals producers, the D.F.C.S will try to sell some of the milk locally and only supply the surplus to the neighbourhood dairy plant.

EMPLOYMENT SCENE

Milk industry is providing employment opportunities and this is raising the standards of living of the rural population. In smallholdings milk is providing substantial employment in the holdings, milk collection points and in the processing plants.

Meru dairy plant provide employment for 48 people. Out of the total employees of 48 in the plant, only 12 were skilled. These were in managerial, clerical and supervisory positions. Thus about 75 percent of the workers were unskilled. Majority of the workers had gone up to Form Four; and they had no post-secondary training.

The plant is located in Meru Town; It is creating employment for the rural-urban migrants, who would otherwise be unemployed loitering in urban centres. Assumably these workers repatriate their incomes to their families in the rural areas; and very little income is spent in town.

In the plant, hundred percent of the operatives came from the district. Thus one can contend that all the employment benefits from the plant accrue to the district.

INCOME GENERATION AND INCOME LEVELS

The employment in the Dairy Plant can be seen to provide livelihood for the people directly or indirectly involved in the plant. It can be assumed that a significant proportion of income paid in form of salaries is repatriated to the families of the employees in the rural areas. Because of the high standards of living in urban centres, however, the amount repatriated must be assumed to be small. The employees were paid 0.7 million Kshs. per annum in form of salaries. Thus an average work received 1,200 shillings per month. From this evidence, one contend that milk industry is playing a vital role in the process of rural development in terms of employment creation and generation of incomes.

In 1983/84 crop year, the dairy plant made sales of 14 million shillings out of 2700 kgs. sold. Notably, 1984 was its first year of operation.

MARKETING:

Production and consumption statistics of milk in Kenya indicate that domestic demand for fluid milk in recent times has been increasing. the demand for milk in Meru is high. This is evidenced by the fact that more than 50 percent of the processed milk is consumed in the district. Most of it is bought by Hotels and shopkeepers. Less than 50% is sold

outside the district to such places like Nairobi, Isiolo, Nanyuki, Embu, and other adjoining districts.

BASIC INFRASTRUCTURE:

ROADS:

Physical communications network particularly roads have a major role to play in the development of any industry.

Generally speaking, the marketing infrastructure for milk in the district are very poorly developed and sometimes lacking. The roads are impassable during the 'flush' seasons, and this leads to spoilage of milk. Alternatively, roads are very dusty during dry spell. This militates against proper milk marketing machinery in the district.

So the breakthrough of smallholder milk production in Meru calls for the review and assessment of the marketing infrastructure system in the district. There is high potential which can be harnessed to attain self-sufficiency in milk production.

In conclusion, milk industry as contributed significantly towards the process of rural development. Needless to say, the industry is providing milk for family consumption, employment opportunities and incomes. It may be observed that the industry has not aided infrastructural development in the rural areas.

3.3. SUMMARY:

This chapter aimed a study of agro-industries in the district and their catchment areas as case studies. The agro-industries examined are: coffee processing, tea, timber, maizemill, cotton ginning and dairying. It was hoped that this would assist one to understand and appreciate the role of industries in the process of rural development.

It is clear from the survey findings that the role of agro-industries in creating incomes and employment in the rural economy is significant. It was found that coffee and tea industries are the most important employers among the agro-industries in the study area. Similarly the incomes created either indirect employment in the industries or the setting off of other activities is also quite a significant contribution to the rural economy.

Conversely, it is also found from the survey findings that majority (97.5%) of the people employed in agro-industries are from the district. One can argue that the employment and incomes' benefits of the industries accrue to the district.

Also, it is clear from field survey findings that there is surplus raw materials and industrial

by-products that may be used in new industries in the district.

The implications of the study findings will be examined in the next chapter to determine and evaluate how such findings can be used to increase the efficiency of the agricultural resource use potential with a view to raising employment opportunities.

SYNTHESIS

4.1 INTRODUCTION

This chapter is the Synthesis Chapter. It dwells on the agricultural potential, in so far as, this potential could be utilized to boost rural development. The Chapter examines and assesses the agricultural resources which have scope for the development of agricultural processing activities in order to provide employment opportunities to the rural population. It (Chapter) answers two fundamental questions: What are the agricultural resources which have the scope for development, and which are the agricultural processing plants (industries) that will boost rural development in terms of providing employment and incomes.

In Chapter One it was indicated that the unemployment problem is exceedingly becoming more serious in Kenya and even Meru. Unemployment problem is not only serious in Kenya, but in all the less Developed countries, which have had no opportunity to industrialize. This problem of unemployment has been brought about by sheer population growth and very few existing alternative gainful employment activities. Consequently, there has been rural-urban migration by young able-bodied school-leavers in search of employment opportunities. This migration (rural-urban) is accentuated mainly

by : the system of education which makes young school leavers to aspire for white collar jobs available in urban areas: and the population pressure on land which compels the farmers' sons and daughters to leave rural areas and look for gainful employment elsewhere. Of course, they all move to urban areas.

Michoma, 1980 contends that population pressure on land is reducing the land productivity and therefore there is need for off-farm employment opportunities. The small plots of land cannot sustain the whole family. In fact, there is under-employment and disguised unemployment in agriculture.

The less developed countries have unemployment as their main agenda, and they are looking for ways and means of alleviating the problem. Hence boost rural development where majority of their population reside practising agriculture.

Power 1971, Chuta, E. and UNIDO Reports, and Jackson, 1963 argue that industries have a role to play in the process of rural development. They are vital because they can generate employment and incomes that can stimulate greater productivity and bigger domestic markets as a result of raising domestic consumption and raising standards of

living of the rural population. Power reiterates that industries act as dumping work place for surplus labourforce from agriculture.

Michoma 1980 found out that the agricultural processing plants (factories) are very vital in so far as rural development is concerned. They have significant impact to the regional economy in form of regional multiplier. The processing plants (factories) provide employment, incomes and basic infrastructure, in addition to providing goods and services needed by rural population. These processing plants will be found in the heartland and hinterland. They generally involve bulky inputs, weight loss and in the case of food processing, perishable raw materials. The processing (activities) plants depend on agriculture for their raw material supplies. Thus the two sectors are complementary and depend on each other for inputs.

Since Kenya is predominantly agricultural, the initial types of manufacturing will involve processing agricultural products. These processing plants (activities) will be found in the sources of raw materials (that is, rural areas). So the first and foremost prerequisite for setting a processing plant is to establish the source of raw materials among others. It is evident that Meru has a high agricultural production and

potentiality for the development of processing plants in order to provide employment opportunities. The agricultural production figures are very impressive. The figures justify the development of processing plants (vegetables and fruits, potatoes, cotton, tobacco, hides and skins etc.). The survey findings portray that there is surplus raw materials (cotton and milk) and by-products (cotton seeds) from existing processing factories (plants) that may be utilized in new processing plants.

The Chapter (four) is truncated into two main parts:

Part One starts by explicitly identifying the major problems/constraints which have and/or are likely (to) militate(d) against full utilization of industrial and agricultural potentials in the district. Further, the part examines the surplus raw materials from the existing processing plants (extra-potential). The processing plants (the only) examined are: Coffee, tea, maize, timber, cotton and dairying. These are the agricultural products which are processed in the district. It envisages the examination of raw materials availability for extra new factories or expansion of the existing or both. Also it assesses the underutilization of the potential in

terms of the number of present processing plants and their capacities. For the underutilized plants (factories) suggestions are given on how they could be fully utilized. In all these cases, the number of jobs likely to be created by each and every processing plant are estimated.

Part Two examines the agricultural production figures for the major agricultural activities and suggests which products have scope for development of processing plants (factories) in order to provide employment opportunities. Further, it assesses the raw material situation and the market outlets (domestic and external) for the products.

In all the two parts, employment creation at the farm levels is discussed. However, it may be noted that it is difficult to give the precise figures for the number of persons employed at the farm level.

PART I

4.2.0 PROBLEMS/CONSTRAINTS IDENTIFIED IN THE DISTRICT

In an attempt to examine the constraints/problems encountered by the existing agricultural processing industries, it was found out that the major problems were associated with the spatial distribution of basic infrastructure. These infrastructure were either inadequate or lacking in certain areas,

and they tended to militate against the full utilization of resource potential of the district. One starts from the premise that the identified problems/constraints hinder the full utilization of rich resource base of the district. They hinder the full participation and contribution of agricultural processing industries in the process of rural development, especially in providing employment opportunities and increased incomes. The removal of problems/constraints is necessary to improve the performance of small scale farmers, the agricultural processing plants and increase farm incomes and employment opportunities. The problems identified were:

4.2.1 LOW LEVEL OF INFRASTRUCTURAL (BASIC)
DEVELOPMENT

(i) ROADS

Transportation of fresh raw materials to the agricultural processing factories is very necessary. A common problem identified in the transportation is the poor condition of roads particularly during the "flush" seasons. The "flush" periods coincide with the rainy seasons when road conditions are poor. It implies that if a vehicle is stuck in the mud it cannot be able to collect raw materials (tea leaf, cotton, etc.) from the buying posts. Nor can it be able to distribute the final products from the processing plants. This results in spoilage of such

raw materials like milk, tea leaf and others.

The road network system are poorly maintained in all the agro-economic zones of the district. Construction of "tea roads" is done by the K.T.D.A. with the aid of the Ministry of Transport and communications. The M.O.T.C. however, only maintains classified roads which leaves the majority of "tea roads" unmaintained since they are unclassified. Coordination between the K.T.D.A. and the M.O.T.C. is necessary in maintenance of unclassified tea roads which are the ones where transportation problems occur most.

The seriousness of transportation problem cannot be overemphasized. Twenty two out of the twenty six processing factories interviewed mentioned poor roads as the major problem encountered in so far as their processing plants were concerned. The poor roads hampered the collection of agricultural raw materials from the buying posts; and even, the distribution of semi-finished or finished products to the next stage of processing and/or marketing. In fact, the situation is worse in tea and coffee zones, where the roads are impassable during the "flush" seasons.

Very few kilometres of roads are either

bituminised or gravelled in the district. The bituminised roads connect major urban centres. The roads have little or no regard to the rich agricultural hinterlands. The feeder (access) roads are in pathetic condition. Actually, there is need for DDC to pay more attention to feeder roads which serve the small scale farmers in the rural areas.

(ii) POWER (ELECTRICITY)

Continued supply of energy is essential for manufacturing enterprises. The tea, coffee, cotton, etc., require electricity so as to be able to process their raw materials efficiently. It is required not only for running the machines, but also for lighting and cooking, to mention a few. However, the distribution of electricity to factories in various areas of the district is far from even. Very few institutions such as schools, and hospitals have electricity.

According to field survey findings only 30% of the factories which were visited had electricity, and 70% had none. In fact, the factories which had power (electricity) are located in the principal town (Meru).

In examining the designated service centres

with electricity installation, it was very clear that the rural electrification process has taken off, although at a very slow phase. The four urban centres (Chogoria, Chuka, Nkubu and Maua) have electricity from the National grid system connected to the Kindaruma dam. Very few rural and market centres are provided with the electricity in the district. It is essential that the Kenya Government in conjunction with Kenya Power and Lighting Company should hasten the rural electrification exercise.

(iii) TELEPHONE AND POSTAL SERVICES

Many designated service centres in the district do not have telephone and/or postal services. According to the district data, only twenty service centres have postal services, and ten centres have telephone exchange operating. All these services are far from adequate especially when one considers the size of the district.

The vitality of telephone and postal services in processing plants need not be overemphasized. They ease communication. The field survey findings reveals that only 10% of the twenty coffee factories interviewed had telephone services. These factories (have) happened to be located in designated service centres which had telephone services. The remainder,

90% expressed the desire to have telephone services so that they may be able to communicate with the Union Headquarters in Meru town. All the processing plants which are located in Meru town had these essential services.

(iv) WATER SUPPLIES

Water is essential not only for human usage but also for industrial purposes. Industrial activities require differing quantity of water per day depending on the nature and the type of activity. For example, coffee pulping factories require a lot of water, hence they tend to locate near sources of water. Thus the location of particular industries would significantly be influenced by the availability of water.

Most of Meru is relatively well served by permanent rivers from Mt. Kenya and Nyambene hills. The district has many water schemes. However, despite of this, many section of the district are not served with safe drinking water. In 1979, there were over 200 water schemes in operation. Many were constructed by self-help groups assisted by the Government funds and personnel. Majority of the existing water projects are located in the upper parts of the district.

(a) RURAL WATER SUPPLIES

Currently there are about six main rural water supplies in the district. They serve a population of well over 104,000 people. Boreholes are not prevalent in the area, except Muthambi Girls and Kanyikine Catholic Mission which draw their water from bore hole dug by the Ministry of Water development. The problem with rural water supplies is that the schemes are concentrated in high potential areas: whereas medium/marginal potential areas have a real water problem. And also the water is not treated.

(b) URBAN WATER SUPPLIES

The main urban water supply is serving about 30,000 people, majority of whom are in Meru Town. The small designated service centres obtain the water from the existing rural water schemes or, from minor urban water schemes installed by business owners through self-help contributions. From this, it is evident that designated service centres do not have, adequate, portable, safe water. In fact, only Meru town has potable safe but inadequate water supplies.

(c) WATER SUPPLIES FOR INDUSTRIAL PURPOSES (PROCESSING)

The location of industries is influenced very much by water availability, among others. Agricultural processing industries require a lot of water. The field survey findings revealed that hundred per cent of the factories had no problem of water supply. However, the maizemill manager claimed that they experienced shortage of water at times. He associated the sporadic water shortages with the pipe breakages and the rationing by the Municipal Council.

It is clear from this that the district is well endowed with water resource (rivers) which emanate from the two huge land masses. However, one thing is clear, that the water consumed is in raw state hence unsafe. The water provided in designated service centres through self-help groups is not treated; nor is it enough to sustain a manufactural plant. There is only one urban centre water supply in the whole district serving Meru town. This urban water supply scheme is inadequate for the whole town.

Although the visited processing factories did not mention water supply as a problem, it should be borne in mind that coffee factories locate near the rivers where they can obtain water easily by digging trenches. However, they expressed desire to have piped water, which they expressed was more safe and convenient to use.

4.2.2. INADEQUATE STORAGE FACILITIES

Stores are essential for the storage of surplus agricultural produce from the rural areas. They provide regular raw materials to processing plants, (for example, maizemill) in addition to making foodstuff available to rural population during the drought periods. However, the storage facilities are inadequate in Meru. The National Cereals and Produce Board, currently buys grain from very few farmers (less than a quarter) due to the smallness of the stores/facilities which cannot cope with the grain production in the district.

The K.P.C.U. godowns in Meru town are meant for storing dry coffee beans before transshipment to K.P.C.U. mills in Nairobi .

4.2.3 LACK OF AND/OR INADEQUATE MARKET OUTLETS FOR AGRICULTURAL PRODUCE

Organisation of proper market outlets is a prerequisite for the development of any crop policy. An active marketing organisation for particular crops in Meru is lacking and/or inadequate. Market outlets act as incentives to farmers because of a guaranteed ready market for their products. Consequently, lack of, and/or inadequate market organisation for agricultural produce acts as a disincentive to farmers (small scale) in the district. The crops which do not have organized

marketing system include among others: potatoes, mangoes, tomatoes, cabbages, sunflower, and citrus fruits. The potatoes rot in stores due to lack of market outlets.

Also lack of and/or inadequate marketing organisation leads to under-utilization of land potentials in certain areas of the district. The farmers are demoralized by poor marketing system. Marketing of cash crop is well organized in the district, but not for all the cash crops. For example, pyrethrum, milk and cotton have unsatisfactory marketing system. In fact, the poor marketing systems delay payments (payout) to small scale farmers who do not want to increase the production. So improving the productivity of small farms could be performed through some technical and some organisational methods. Better credit and marketing facilities are examples of organisational improvements.

The marketing of pyrethrum, for example, is pathetic. When pyrethrum flowers have been harvested they must be dried before being marketed. In Meru the small scale farmers dry their flowers and put them in bags ready for collection by the Board lorries. To one's surprise, the Board lorries do not collect the dried flowers on time. Sometimes the farmers wait for 12 months. Worse still, it takes more than three years for the farmers to get payments from the pyrethrum Marketing Board. Needless to say,

marketing system include among others: potatoes, mangoes, tomatoes, cabbages, sunflower, and citrus fruits. The potatoes rot in stores due to lack of market outlets.

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this poor marketing system coupled with delay in payments act as disincentives to small scale farmers of Pyrethrum.

4.2.4 INADEQUATE EXTENSION SERVICES

Extension services are essential for the district to experience mass production in the underutilized areas. Mostly the underutilized zones are the medium/marginal potential areas which have a high agricultural potential - so to speak.

The provision of extension services to small scale farmers is likely to boost the productivity (agricultural) of the district; hence there would be surplus raw materials for agricultural processing factories. The district would also be self-sufficient in food production.

The extension services include provision of better hybrid varieties of seeds, fertilizers etc. and the technical advice on better farming methods. The combination of all these extension services will improve the productivity of small scale farmers in the rural areas.

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The provision of extension services to small scale farmers in the district is minimal and of

unplanned nature. Moreover, there is tendency by the Ministry of Agriculture to direct these services to high potential areas with little regard to other areas especially medium/marginal areas. Worse still, the employed technical personnel orientate their efforts towards the "progressive farmers" and neglect the small scale farms which contribute quite a substantial amount of the Gross Domestic Product (GDP).

To some extent, the low agricultural productivity in the district can be attributed to lack of knowledge about better farming methods on the side of the farmers, lack of and inadequate marketing system and bad state of rural roads which means that high transportation cost prevent farmers.

4.2.5 HIGH TRANSPORTATION COSTS

The problem of high transportation costs was identified with milk and cotton processing plants in the district. Although it was expensive to transport milk and cotton from the buying posts to the processing plants: more escalating costs were experienced in the transportation of surplus milk from Meru to K.C.C. plant in Kiganjo (Nyeri). It was equally expensive to transport surplus cotton from Meru to Mwea Ginnery in Kirinyaga District. It was quite

unbelievable that a substantial amount of milk got spoiled on the way to Kiganjo K.C.C. plant. The high transportation costs and the spoilage of milk reduces the amount of cash paid to the small scale dairy farmers. This reduces the morale of the farmers who had wanted to keep more animals. If this salvaging panacea ill is allowed to continue it may have an adverse effect on the dairy industry in the foreseeable future. There is need to rectify the situation by providing an extra dairy plant. This plant will reduce spoilage of milk, transportation costs, provide employment, increase farm incomes and provide goods and services needed by the rural population. Particularly, the processing plant will have an impact to the regional economy.

The transportation of excess cotton all the way from (Gaitu) Meru to Mwea Ginnery in Kirinyaga, is by any standards, costly. This transshipment of cotton is expensive and reduces the quality of the cotton, hence poor market prices. Consequently, the poor export prices of cotton discourages the small scale farmers who may decide to grow other crops which are more paying. This state of predicament need to be rectified by constructing an extra cotton ginnery in the cotton growing zone. The ginnery will provide employment opportunities to the rural

population, the would-be migrants to urban areas. Also the ginnery will give incentives to cotton farmers to increase the area under cotton crop. It may also attract fresh "cotton growers into the industry.

4.2.6 LACK OF AND/OR INADEQUATE TRAINING FACILITIES
LEADING TO HIGH COSTS OF CREATING A SINGLE JOB
IN AGRICULTURAL PROCESSING PLANTS

The capital cost of creating one new urban job in Kenya is 10-15 times as expensive as it is (say) Western Europe, when the unit of measurement is gross domestic product per head of population ⁸³. Also the capital cost of creating a single job in industrial processing factories in the rural areas is equally expensive when the unit of measurement is $\left\{ \frac{K}{E} \right\}$; where (K) is the initial capital invested in the construction of the plant divided by the number of employed persons (E) in the plant.

It was observed that the cost of creating a single job in the industrial sector in the rural Kenya differed from one industry to another of course, depending on the size and structure of the complex. The cost of creating one job in coffee factory ranges

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between 1500 and 5000 Kenya shillings, whereas in tea factory it was 2,500 Kenya shillings. From the fiels survey findings it was clear that it is 10 times as expensive to create a single job in dairy processing as it is in coffee processing.

The reasons for high costs of creating jobs in Kenya is attributed to lack of training facilities in both urban and rural areas, and that the training is on the job. On-the-job training wastes a lot of money, time and materials.

In Meru there are no industrial institutions except may be Meru Institute of Science and Technology and the eleven village polytechnics in the district. To some extent, these twelve institutions produce qualified personnel, some of whom are absorbed in the processing plants (for example, Mechanics and other cadres with different industrial skills. These are engaged at different stages of the processing.

From this it is clear that the district has inadequate industrial training institutions for workers. This makes the creation of a single job too expensive, and consequently, this has a significant economic impact to the rural industrialization policy.

Thus there is need for the District Development Committee in conjunction with the Government to set up industrial training institutions in the rural areas. In so doing they will reduce the costs incurred when "fresh" industrial workers who have no training are employed. Consequently, the availability of trained personnel will incite foreign and indigeneous capitalists investors to invest in resource based (agricultural processing plants) industries in the rural areas; hence increase employment opportunities, rural farm incomes and other related benefits.

4.3 EXTRA-POTENTIAL IN THE EXISTING PROCESSING PLANTS

4.3.1. COFFEE

The importance of coffee industry cannot be overemphasized. In addition to foreign exchange earnings, coffee industry provides gainful employment opportunities. Thus the significance of the crop can be evaluated in terms of its place in total farm incomes, employment, contribution to foreign exchange and to gross domestic production. Coffee industry is the largest single employer. The employment is concentrated in large scale plantations, peasant holdings and processing plants. However, it is rather difficult to give precise figures for the persons employed in the industry.

In Meru, coffee is by far the most important single cash crop and export commodity. It ranks first in the district followed by tea. By 1984, 34,581 hectares were under coffee crops in the district; and the production was 12 million kilos of coffee cherry.

COFFEE FACTORIES AND PULPING

Meru has more than 200 coffee factories which pulp (process) nine million kilograms per day. These factories are distributed all over the coffee growing areas. In fact, they are conveniently located, except in very few areas where farmers are compelled to travel long distances to deliver their coffee. The deficient areas are mostly in Tigania, Igembe and North Imenti divisions. Otherwise, south Imenti and Nithi divisions have more than adequate number of coffee factories. However it is estimated that with good farming methods and paying of much attention to coffee, this area will require extra factories. Coffee is the main cash crop of South Imenti and Nithi divisions. Thus increase in coffee prices in the world market may encourage small scale farmers to increase the production.

The areas under-served with coffee factories are mostly in Tigania, Igembe and North Imenti divisions.

An average coffee factory has an intake capacity of 45,000 kilograms daily; and an output of 30,000 kilograms of clean coffee berries. Using the annual production figures (yields) and the daily intake capacity of a single factory, one can crudely establish whether there is need for extra factories, or whether the existing factories are underutilized in a particular region. However, one has also to know the area under coffee crop. Unfortunately, there are no available figures to show how many hectares/acres of coffee bushes can sustain one factory.

In fact setting up a coffee factory is based on two major criteria : the total production (yields) figures per annum, and the distance a farmer is compelled to walk to deliver his coffee. So setting up a new factory is gauged in the basis of the two criteria. And the total production depends on: (a) farming methods adapted (agricultural inputs) and the climate/soils of the region.

DATA ANALYSIS AND INTERPRETATION

In 1979, the district had 157 coffee factories in the whole district. These factories served an area of 6,300 hectares which were under coffee bushes. However, these factories were not adequate

at the time. More factories were constructed between 1979 and 1984 bringing the total number to about 200 factories. Today, these factories are far from enough. The people travel long distances to deliver their coffee in certain areas of the district. There is also over-congestion in the existing coffee factories. Additionally, a substantial amount of coffee berries is taken to other divisions for pulping specially during the peak periods.

Currently, the district requires about seventeen extra factories in an attempt to reduce over-congestion and long distances travelled by small scale farmers. According to the analysis, each factory will employ 10 permanent workers, and quite a number of casual labourers. The seventeen factories will have potential employment of 170 permanent workers and 400 casual labourers.

The factories will create employment at the processing plant as well as at the farms. At the processing plant people will be engaged in various stages of the processing; whereas, at the farm levels, farmers (small scale) will employ labourers to assist with farm activities. However, it may be noted that employment on the farm levels is seasonal and fluctuates from time to time depending on the availability of work to be done. At pulping

factories' level permanent employees are not affected except the casual labourers who are paid on daily basis.

TIGANIA AND ISEMBE DIVISIONS (MERU NORTH)

Tigania and Igembe divisions have 19 coffee factories. There are three cooperatives which act as the umbrella to the 19 factories.

According to the manager of the Meru North Union, the area needs extra coffee factories to ease congestion in the existing nineteen factories in the two divisions. Additionally, the extra coffee factories needed will minimise the distances farmers have to travel to deliver their coffee. The manager expressed his concern over the spoilage of coffee berry due to inadequacy of pulping factories to cope with the coffee supplies from the small scale farmers.

The data gathered from the two divisions, revealed that the area requires extra seven new factories. These factories will be conveniently located so as to serve the small scale growers efficiently and effectively. Each factory will create employment for ten permanent employees and between twenty and 30 casual labourers.

NORTH IMENTI (MERU CENTRAL)

Currently, Meru Central Union has eighty five factories serving one enormous division. These factories are far from enough. In certain regions of the division people travel long distances to deliver their coffee. There is over-congestion in the existing coffee (pulping) factories in certain regions. Thus all in all, there is need for some more ten coffee factories in the division. The ten factories will create employment for 100 permanent employees and a number of casuals. These will be engaged at different stages of coffee (pulping) processing.

NITHI DIVISION (MERU SOUTH)

According to the data gathered about this area, it seemed that the area had adequate number of pulping factories. In fact, there was under-utilization of factories - because of poor planning and politics of sectionalism. If a group of small scale farmers felt that they needed a factory near their vicinity, they went ahead and constructed unabated.

Today, Nithi division does not need extra pulping factories. The first priority may be to ensure that the underutilized factories do not operate

below capacity as it is the case. Unlike Tigania and Igembe where the area is exhausted with coffee bushes Nithi has a high potential for growing more coffee buses. There are extensive chunks of land which could be planted with coffee bushes. And in so doing, there would be enough coffee for the underutilized factories; and may be for surplus new extra factories in the area. The new factories may be beneficial in the following ways:

- (a) minimize distances travelled by some small scale farmers to deliver their coffee.
- (b) provide employment to the rural population
- (c) encourage farmers to produce more coffee by utilizing modern methods of farming, or increasing area under coffee bushes; and
- (d) raise rural farm incomes.

Thus increasing coffee production in the area is possible through application of modern farming methods. This would increase yield per tree. Consequently, the high yield per tree will ensure that there is full utilization of land potential. Also the high yield per tree will ensure full utilization of the underutilized factories and the establishment of new factories which will create employment opportunities for the rural population.

BENEFITS OF THE PULPING FACTORIES

The benefits of the pulping factories can be seen with our naked eyes. The benefits are socio-economic in nature. Coffee industry, like any other agricultural industry is labour-intensive. The ploughing, planting, weeding, spraying, picking and processing have not yet been mechanized; this is impracticable presently.

Thus coffee pulping is also far from proper mechanization. In fact, it is only in the pulping stage where the machine is necessary. All the other stages are labour-intensive - so to speak. So the importance of pulping factories include pulping, drying and transporting of dried coffee beans to K.P.C.U. godowns. This chain of activities create employment opportunities to the rural population, neighbouring the coffee factory.

The proposed extra seventeen pulping factories in the district will provide employment to 170 permanent employees and approximately 400 casual labourers. It is projected that each pulping factory will employ 10 permanent employees, and between 20 and 30 casual labourers. -However, it may be noted that employment of casual labourers is on daily basis. The number of labourers to be employed by a factory depends on the availability of work. Thus one will find that there is more work to be done

during the peak seasons (picking) and this is when so many people are employed in the factories. Actually, there are more employment opportunities in the whole coffee industry during the peak seasons. The employment opportunities commence from the farms, through processing to distribution of the final products to the consumers.

Thus, the setting up of the proposed extra pulping coffee factories will provide employment opportunities, reduce distances travelled by small scale farmers to deliver their coffee and increase rural farm incomes. All in all, the factories will have an impact to the regional economy.

4.3.2 TEA

Tea is the second income earner in the district. The area planted with the crop has increased considerably from 4,609 hectares in 1976 to 6,557 hectares in 1984. Also the number of tea growers have increased from 12,211 to 17,003 in 1976 and 1984 respectively. These increases can be attributed to high export prices of tea. Farmers have known that tea is an enterprise with high returns. Consequently, there is likelihood that tea growing will continue due to the fact that the commodity is commanding a good market.

The development of tea will : (a) reduce the disparity in the distribution of incomes (b) create new productive capacity in many parts of the district (note: the Government has initiated tea growing programmes along the forest boundaries) (c) provide meaningful year round, employment to thousands of farmers on their own farms, regular wage employment to farmers' sons and daughters in the processing plants, collection and transportation network (d) trigger other activities (economic) and provision of basic infrastructure to the rural population.

TEA FACTORIES AND EMPLOYMENT

Presently, the four tea factories in the district are adequate to process the tea supplies from the rural small scale farmers. However, with the remarkable increase in tea prices, the farmers will increase the area under tea as alluded to. During the field survey, it was observed that many small scale farmers had set aside small portions of land to be planted with tea. They had set up tea seedling nurseries of different sizes. From this, it is very clear that the area under tea will increase considerably in the near future. Subsequently, the Government has initiated tea growing programmes along the forest boundaries (Imenti forest), that is, 300 metres from the boundary. With the increase

in area under tea crop, the existing four tea factories are likely to be inadequate. None of the 4 factories has enough room for expansion, and after all, they have reached maximum expansion size according to K.T.D.A. standards.

Consequently, the district will require extra tea factories to process tea leaves from the small holder farms and the Government farms along Imenti Forest. According to the K.T.D.A. official at the Headquarters in Nairobi, Meru will require extra two factories by the year 1992. The official's contention was that the average yield per hectare in the district has increased substantially from 2,000 kgs. per hectare (1974) to 2,925 kgs. in 1984. This they projected will increase further to about 3,700 kgs./hectare in 1992/93. Also the Government tea farms are likely to produce quite a substantial amount of tea leaf. So the official expressed that the Government tea farms may need their own factory; although it is most likely that it will be supplemented with tea leaf from small holder farms.

The two extra tea factories are likely to have potential employment of between 200 and 300 persons (factory level). The number of jobs to be created are enumerated in the light of the existing tea factories which employ an average of 100 workers at

the factory level. Therefore it is estimated that since all K.T.D.A. factories are designed in the same way and have the same capacity; the new factories will each employ about 100 persons. Thus the two of them are likely to create employment for about 200 persons. These people will be engaged in different stages of tea processing in the plants. Additionally, the tea factories will employ quite a substantial number of casual labourers.

There will also be an escalation of employment opportunities at the farm levels: that is, in the Government tea farms and the small holder farms. The Government tea farms along Imenti Forest will create employment for a large number of school-leavers; would- be migrants to urban areas to seek employment. Thus these farms would act as intervening opportunity for the rural urban migrants.

Further, one can assume that factory and Government tea farm workers will employ labourers on their land holdings and also create employment and incomes. There are also those employed in the leaf bases attached to the factories, those employed as drivers to transport green leaf to the factories and those employed as technical advisors at the farm levels (extension officers). Thus employment opportunities created by the factories either directly

or indirectly are difficult to assess precisely because they affect the economy at so many points.

In nutshell, the importance of tea industry may be seen in the whole context of linkages. The industry can be seen to provide livelihood for the people directly or indirectly involved in the factories and the farms.

4.3.3. MAIZE

Maize is the most vital staple food in Meru district. The area under maize has increased considerably from 33,362 hectares in 1974 to 100,000 hectares in 1983. Likewise, the production has equally increased from 57,600 tonnes to 93,000 tonnes in 1976 and 1983 respectively. There are about 200,000 small holder maize growers in the district. These people are directly employed at the farm level.

MAIZE MILLING

There are numerous posho mills in the district. These are located along the river banks, and others in the designated service centres. Those located along the river banks use water power to drive the grinding mortar; whereas, those located in designated service centres use electricity. The posho mills provide employment to a negligible fraction of the population. A posho mill can provide

employment to the owner, and one or two other assistants, whom in most cases are said to be relatives of the owner.

The main maizemill is located in Meru town. This mill was built by Meru Central Union at a cost of 15 million Kenya shillings. The mill has an intake capacity of 750,000 kilograms of maize daily, and an output of 150,000 kilogrammes of flour (unga). Together with the mill is the animal feeds industry. The animal feeds industry makes food for pigs, chicken and cattle.

RAW MATERIALS SITUATION

Although a substantial amount of maize is produced in the district it is far from enough. It is not adequate to sustain the existing mill which has an intake of 750,000 kilograms daily and 225 million kilograms annually. This amount is not available in the district, even when one combines what is consumed at home and what the small scale farmers dispose for the maizemill.

From this, it is evident that the mill gets raw materials (maize) from outside the district. In fact it depends on the National Cereals and Produce Board in Meru for its supplies. At times, it gets maize as far away as from Sagana Board Depot. Thus it was clear that Meru will not require an additional mill but will

need to expand on the existing in the future.

The first and foremost priority in so far as maize industry is concerned, is may be to ensure that the mill get adequate raw material (maize) from the district. This would mean that farmers will have to be given incentives to increase maize production (yields). The incentives may be in form of fair prices, agricultural inputs, proper marketing organization and extension services. In so doing, the district will be self sufficient in maize production, both for home consumption and surplus, for agricultural processing plant (maize mill). Also there may be surplus for external markets, hence foreign exchange earnings which is very much needed for National development. The incentives to farmers will set in motion other economic activities like providing employment opportunities at the farm levels.

MARKET OUTLETS

The market outlets for flour and maize is very promising. In fact, 50% of what is produced in the mill is consumed in the district. The remainder is sent to Isiolo, Marsabit, Embu, to mention a few.

The major buyer of maize from the small scale farmers is the National Cereals and Produce Board.

The most astounding thing is that the Board offer very poor prices to farmers. Worse still, the Board delays the payments to farmers. Also the Board is unable to buy all the produce from farmers due to shortage of storage facilities in the district. All these setbacks act as disincentives to small scale farmers.

However, there is need for the Board and the Government to give more incentives to maize farmers in the district. Such incentives include paying fair prices for the produce bought, and thus should be paid promptly; the Board should expand the storage facilities so as to be able to buy all the produce from the farmers. Also there is need to provide extension services to farmers.

⁴ .3.4. TIMBER

In Kenya forests are owned and managed by the Government (Forest Department). The gazetted forests in Kenya cover only 3% of the total land area (1.7 million hectares). Timber milling industries derive their raw materials from plantation forests; others exploit logs from the indigenous forests. The total log intake by saw mills in Kenya is 520,000 m³ annually, and 85% of this comes from the Plantation forests.

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Previously, the Forest Department could supply enough to all licensed saw mills in the country. Today there is no scope for saw mill industry in Kenya. Most of the exploitable timber is from plantation, but the area under plantation has gone down due to high demand for logs by local timber industry. This has been brought about by the mushrooming saw mills all over the country.

RAW MATERIAL SITUATION

Meru district has more than eight saw mills, twenty one saw benches and sixty two pit sawyers. They are found in all the divisions except Tharaka. The eight saw mills exploit gazetted forests under Government licences. Today, the operation of licensing is minimal. Many saw mills operate by obtaining logs from the private forests and farms. In fact, by the time of this study, majority of the saw mills were on the verge of closing down their operations. Thus, one can contend that the future of the industry (timber) is predictably bleak. Recently, the Government, in her effort to conserve the water catchment areas and the general environment, discouraged the plantation of natural forests.

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and this, subsequently, will depend on how much land is put aside for afforestation or is under forests. In fact the production could also be raised through agro-forestry practices, where farmers inter-plant certain species of trees with crops. All these possibilities may materialize if the farmers are promised fair returns by the log buyers.

It is very clear that the Government plantation forests will only be able to provide enough raw materials to a small number of saw mills. Thus the saviour of the saw mills may be the private forests and farms. But they need to be given incentives so as to increase logs production. Probably, the private forests and farms will create employment opportunities for the rural population. The employment opportunities will be created both at farm and the log processing levels (saw milling). Hence there is need to encourage private forests and agroforestry practices in the rural areas.

4.3.5 DAIRYING

Milk production in Meru is relatively high (Chapter 2). The producers range from small scale farmers to large holdings in Timau area. The small scale farmers market their milk through Dairy Farmers Cooperative Societies, whereas, large holder farms market individually to Kenya Creameries Limited (K.C.C.)

at Kiganjo (Nyeri). There are 13 Dairy Farmers Cooperative Societies through which the small holder farms market their milk. Large proportion of the total milk produced by small holder farms is retained at the farm primarily for family consumption and for feeding to the calves.

marketed surplus is usually handled either locally by private dealers and/or Dairy Farmers Cooperative Societies or by the K.C.C. Limited. In Meru the milk produced by small holder farms is sent to Meru Dairy Plant, and the surplus is sent to K.C.C. Plant at Kiganjo. Also, a substantial amount of milk produced is marketed locally. In fact, Tigania and Igembe divisions sell their milk locally to institutions (Schools, hospitals, etc) and hotels.

DAIRY PROCESSING

Meru Central Union decided to set up their own milk processing facility in 1983. This action was provoked by milk spoilage and high costs which were incurred when transporting milk (fresh) from Meru to Kiganjo K.C.C. plant (a distance of more than 100 kms). Quite a substantial amount of fresh milk perished before it reached (K.C.C. plant) Kiganjo.

The project was funded by Finish Government, Kenya Government and the Meru Central Union. The project was completed in 1984 with the combined efforts of the three financiers. It costed 32.3 million Kenya shillings. The plant stands on a $\frac{1}{4}$ acre plot, hence it has no room for expansion.

The raw material required is fresh milk; although the polythene papers are also needed for packaging of treated milk. Thus the plant depends on milk supplies from small scale farmers who market their milk through the rural dairy cooperative societies.

The plant has an intake capacity of 20,000 kilograms of milk daily, and an output of 10,000 litres. These figures indicate that the plant's capacity is low due to its size. It may be noted that the plant has small daily intake capacity, hence it cannot cope with local supplies of milk from small holder farms. The plant processes milk from only seven dairy societies. In fact, the other six dairy societies sell their milk locally to institutions, hotels and even homes. A lot of milk is wasted in the district. Also the large holder farms market their milk directly to K.C.C. plant at Kiganjo.

It is evident that a lot of surplus milk is sent outside the district. Most of it is taken to K.C.C. plant at Kiganjo (Table 27).

TABLE No.27:

AMOUNT OF MILK SENT TO K.C.C. PLANT (KIGANJO)

YEAR	1981	1982	1983	1984
KILOGRAMS	1.6 Million	2.5 Million	2.0 Million	0.8 Million

Source: Meru District Agriculture Office, Livestock Development Department.

As indicated earlier, the district has thirteen dairy societies through which the farmers sell their milk. It was also indicated that Igembe and Tigania divisions do not have organized marketing system for their milk. They market their milk locally to schools, hotels, homes etc. According to the Animal Production Officer, they get very little returns, hence discouraged to rear grade cows which produce more milk. Also it is shown that the small holder farms in Timau Area market their milk directly to K.C.C. plant (Kiganjo).

It is evident from this that the existing Meru Central dairy plant cannot be able to cope with the milk production in the district. In fact, the plant is only able to process of milk from the seven

societies in the district. The rest of the milk is either sent to K.C.C. plant or sold to institutions and homes or wasted. The Annual Production Officer expressed with great concern that a lot of milk perished when being transported to K.C.C. plant or being distributed to homes, institutions and hotels. This state of predicament discouraged farmers from keeping grade cows or even caring for the ones they have.

According to the Animal Production Officer, the district requires two extra dairy plants,; one to be located in Timau Area to process milk supplies from large holder farms which market their milk directly to K.C.C. plant at Kiganjo, and the other plant to be located in Meru town to process milk from the six rural dairy societies. The two dairy plants will be of the same size and capacity as the existing Meru Central Dairy plant. The officer expressed that instead of setting up a large plant like the K.C.C. plant at Kiganjo, it is better to have two manageable plants which could be set up feasibly and viably at the sources of raw material. And also reduce transportation costs and perishability of milk when transporting it all the way from Timau to Meru town or Kiganjo.

The existing Meru Central Union plant has no room for expansion; hence the only other alternative is to set up extra dairy processing plants in other localities.

BENEFITS OF THE EXTRA DAIRY PROCESSING PLANTS

The benefits of the extra dairy processing plants may be seen in the light of the existing Meru Central dairy plant. The plant processes the milk from the farmers, who in turn get fair prices for their products. To some extent, the plant has encouraged farmers to rear dairy animals due to guaranteed market for their product (milk). The availability of the market is an essential precondition for production of any commodity; while the price incentive is important because farmers' decision to produce a commodity must be based on how they view the profitability of the commodity vis-a-vis the profitability of alternative farm produce.

The dairy plant has created employment for forty eight persons (48) who could be unemployed and seriously looking for jobs in urban areas. Thus the plant has made a significant contribution to the regional economy. In addition to providing employment both at farm and milk processing levels, it has also provided goods and services needed by the rural population.

Also the plant has increased rural farm incomes and promoted other activities which are beneficial to the rural communities.

Because the two extra dairy plants will be the same size as the existing plant, it is assumed that they (two) will employ about 100 persons who are likely to be from the district. These people will be engaged in different stages of milk processing.

Like the existing dairy plant, these extra (2) dairy plants will acquire milk supplies from the small scale farmers. Also the large scale farmers will be encouraged to market their milk to the company operating in the district. Subsequently, this will mean that sending surplus milk outside the district will have to be curtailed or minimised. Thus it will be an obligation for the white settlers in Timau area to market their milk directly to the company. Also, the dairy farmers in Tigania and Igembe divisions of the district will be persuaded to deliver their milk to the plants. The people of both divisions market their milk locally to hoteliers and institutions like schools and hospitals. The farmers consequently, will be encouraged to keep more dairy animals because of the guaranteed market for their products. Hence a single farmer is likely to employ one or two workers to assist with farm activities. Also, the large holder farms will employ more "shamba boys".

Needless to say, the Dairy Farmers Cooperative Societies must have staff to receive milk from the farmers at each collection centres. With increased

dairy animals, more milk collection centres will be established. Hence more staff will be employed to receive milk from farmers.

The benefits of the dairy plants are numerous. In fact, it is difficult to give present assessment value of the industry, because it affects the national economy at so many points.

MARKET OUTLOOK

The annual per capital consumption of milk of Kenya is 45.2 kilograms annually. The production and consumption statistics of milk in Kenya indicate that the demand for fluid milk is higher than the production. It is very clear, therefore, that the market for treated (processed) milk is very promising.

POTENTIAL CONSTRAINTS TO PROJECT IMPLEMENTATION

The most likely constraint that may militate against the whole implementation of the project is lack of funds, as it were. However, it is anticipated that the international organizations will give financial aids to construct the dairy plant. Also it is hoped that Governmental organisations like I.C.D.C., IDB and others will take the initiatives, with a view that such project will boost rural development.

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4.3.6 COTTON

The need to increase domestic cotton output in the district and the country at large is based on two fundamental reasons:

- (a) the demand for the Nation's mushrooming textile industries; and
- (b) increasing demand for cotton seed for processing by local mills arising from the expanding domestic market for vegetable oils and oil seed cakes.

In Meru, cotton makes a considerable contribution to meet the small scale growers' cash obligations in the medium potential zone. In 1974, 3,150 hectares were under cotton crop as opposed to 1984 figure of 22,000 hectares. It is truism that quite a substantial fraction of district's rural population derive their livelihood from cotton (especially in Medium potential zone).

COTTON GINNING

Until 1985, Meru cotton ginnery had twenty gins which could not manage to gin the cotton produced in the district. Today, the ginnery has 30 gins which are still very far from enough. The total intake capacity is 10 million kilograms annually; and output of 50 bales per day.

Because the ginnery cannot manage the raw cotton supplies from small scale farmers, quite a substantial amount is sent to Mwea ginnery in Kirinyaga District. The figures reveal that there is potential for an extra ginnery in Meru district. The present ginnery cannot be expanded because it has reached maximum size, thus the other alternative is to initiate a new ginnery in the area.

RAW MATERIAL SITUATION

The present cotton ginnery is located in cotton growing areas (Chaaria-Gaitu zone). Cotton here is grown on individual basis. There are no cotton plantations. Thus the ginnery derives its raw material (cotton) from the small scale farms.

This area has a high potential for cotton production. But because of poor marketing organisation and delay of payments to farmers the production has declined considerably. For example in 1974, the yield per hectare was 943.1 kgs. This figure declined considerably to 175 kgs./hectare in 1984. With increased incentives to small scale growers this area can produce more than 5 times of what it produced in 1983.

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Subsequently, with good marketing system and fair prices, the small scale farmers may employ labourers at the farm level. In so doing, the small holders will create employment opportunities for the rural population. Also there will be surplus cotton for extra cotton ginneries in the area. These ginneries will create employment opportunities in addition to providing goods and services needed by the rural population.

NEW COTTON GINNERY

Meru cotton ginnery has an intake capacity of 10 million kilograms annually, and output of 50 bales per day. The ginnery cannot process the whole cotton produced in the district. The remainder is normally sent to Mwea ginnery in Kirinyaga district. In 1985/86, crop year three million kilograms were sent to Mwea for processing. This leads to spoilage of cotton when on transit; and consequently this reduces the export prices. One can contend that there is need for an extra ginnery to process the raw cotton which is taken outside the district (Mwea). The ginnery will provide employment opportunities to rural population; in addition to minimizing the transportation costs of raw material outside the district. The ginnery will also reduce the cotton spoilage, which happens when raw cotton is being transported.

EMPLOYMENT CREATION

The ginnery will encourage the small scale growers to produce more cotton. Subsequently, the growers may employ farm workers to help with farm activities. Thus the ginnery will provide employment both at the farms and the ginnery (processing).

The number of persons to be employed at the processing level (ginnery) may be assessed in the light of the existing Meru cotton ginnery. The ginnery employs 300 persons. These people are engaged in different stages of cotton processing. Assumingly, the new cotton ginnery will employ the same number of persons as the present one (300). Hopefully, these people will be from the district.

Conversely, with the setting up of the ginnery there will be so many job opportunities at the farm level. Many people will be engaged in ploughing cotton planting, spraying, picking and cotton grading (selection). Usually the farmer performs the initial rough shod of grading cotton in the shamba followed by a thorough and intensified grading back home where the whole family participates in the process. Also the farmer may hire few workers to assist him with this tedious work. Although these workers are paid

on daily basis they are normally engaged in gainful income earning activities, hence employed. However, employment here is seasonal with less work in the land preparation periods.

OTHER PLANTS (FATORIES) ASSOCIATED WITH COTTON

The by-products of a cotton ginning industry are mainly, the cotton lint and the seeds. The cotton lint is used in knitting mills (textiles) who make many items like nylon clothes, polyester fabrics, etc. On the other hand, the cotton seeds are used for making vegetable oils and oil seed cakes. In Meru there is no manufactural plants for cotton lint and seeds. There is no textile mill nor a manufactural plant for edible oils. The two by-products, from Meru Cotton Ginnery are sent outside the district for further processing.

Cotton lint is taken by Nanyuki and Thika textiles. They use this raw material to produce cloth (Nylon, polyster etc). The cotton seeds are taken by Nyeri edible oil manufacturers; who make products like cotton seed oil and cakes, washing soap and animal feeds. It is very clear from this that cotton ginning plant has strong forward linkages. The output from the plant is used by other plants as their input. In all this chain of activities many people are employed at different stages.

Now, according to the Manager of Meru Cotton Ginnery, the district has enough raw materials (cotton seeds and lint) to warrant setting up one textile mill and cotton seed oil manufacturing plant. The two plants will get enough raw materials from the cotton ginnery. The local cotton production is high in the district; the existing ginnery operate over the annual ginning capacity. This clearly shows that there is substantial supplies of cotton lint and seed.

Also since the existing cotton ginnery cannot be expanded because it has reached its maximum size, there is a possibility that a new extra cotton ginnery will be installed in the area. The ginnery will provide cotton lint and seeds to the textile mill and the cotton seed oil manufacturing plant respectively. From this it is very clear that the area has an excellent raw material base for three processing (factories) plants: (a) an extra cotton ginnery (b) a textile mill and (c) cotton seed oil manufactural plant.

All in all, the three plants would provide employment opportunities to a substantial portion of the rural population. The three plants will have an employment potential of 500 persons and above. These people will be engaged in different activities in the processing. The estimated employment breakdown are as follows:

- (a) new extra cotton ginnery will employ between 95 and 216 persons
- (b) knitting mill (textiles) will employ between 55 - 118 persons; and
- (c) cotton seed oil and cake; washing soap and animal feeds will employ between 100 and 199 (Appendix II).

It is clear that cotton industry has vital role to play in the process of rural development. In addition to creating employment it has raised rural farm incomes and set in motion other economic activities in the district. The cotton industry has a strong backward and forward linkages. The industry is capable of providing all the three basic necessities of life: food, clothing and shelter.

PART II

4.4 NEW POTENTIALITIES FOR AGRICULTURAL PROCESSING

PLANTS

4.4.1 VEGETABLE AND FRUITS

Kenya has a great potential for horticulture crops and for industrial processing of fruits and vegetables. This has already been demonstrated by successful operations but experience has shown that integrated approach to cultivation, processing and marketing is necessary. However, various possibilities

exist for achieving a good coordination and cooperation without interfering with other interests.

In Meru the production of horticulture crops is relatively high (Chapter 2). The production, in most cases is done on individual basis. The following crops are among those which the horticultural potential has been established: potatoes, tomatoes cabbages, bananas, carrots and citrus tfruits ; mangoes and the passion fruits. The production figures are shown above (Chapter 2). The climate diversity allows a great and diversified choice.

Among the processing possibilities which have been identified as having a particular interesting potential are: potatoes dehydration and preservation, mango processing (canning and preservation), dehydrated vegetables, tomato paste as well as various prepared food like soups.

FRUIT AND VEGETABLE PROCESSING IN KENYA

(a) Kenya Cannery Limited - Thika

This company processes pineapples and has a capacity of nearly 150,000 tonnes per year in addition to canning nearly 5,000 tonnes of vegetable like green beans, peas, tomatoes, sweet corn, etc.

(b) Kenya Fruit Processors Limited (Thika)

It processes passion fruits in addition to pineapple juice from Kenya Cannery. It has a capacity of 20,000 tonnes of passion fruit.

(c) Vegetable dehydration plant

The plant has a capacity of 2,500 tonnes dehydrated vegetables. In terms of raw materials, its capacity is 35,000 tonnes per year.

Unfortunately, Meru vegetable and fruit processing plant will not be the only one in Kenya. There are others as discussed above. These processing plants provide goods which are either home consumed or exported to earn foreign exchange..

VEGETABLE AND FRUITS PROCESSING IN MERU

The district produces a lot of vegetables (tomatoes, cabbages, carrots) and horticultural crops in general. They are grown individually, either through use of the rains or by irrigation. Actually, the use of irrigation practices makes the district to have regular supplies of vegetables all the year round. In fact, most of vegetables like tomatoes, cabbages, carrots, etc. rot in the farms due to lack of proper marketing system. The district has no processing plant. From the vegetable production

figures, it appears that there is need for a vegetable and fruit processing plant in the district.

The district has high potential for vegetable production. The cultivation can be done through irrigation and the use of rain water. The district is well endowed with water resources (rivers) from the two huge land masses (Mt. Kenya and Nyambene hills). This shows that the use of irrigation water is possible in the district.

First prerequisite for any processing plant is, of course, an adequate supply of raw materials, labour supply, fuel, power facilities and efficient marketing channels. Each of these will be discussed in the subsequent paragraphs.

MARKET PROSPECTS

In determining whether to establish processing plants for fruits and vegetables, Government must have some knowledge of the market outlook, both domestic and foreign (export). Also due to unemployment problem, the Government must have some knowledge of how many jobs are likely to be created by the processing plant (recent concern). Generally speaking, consumption of processed fruits and vegetables is currently confined to high income countries. In Africa, even fresh fruit and

vegetable production is geared to the export market, and there is ample room for expansion of domestic consumption of the fresh production before cultivating a taste for the more expensive processed items.

Although there are no figures of trade in processed products, the demand for processed fruits and vegetables in the high income countries is high. The trade in canned peaches, canned pineapples and processed tomatoes has shown a steady increasing trend, and, no doubt there is potential outlet.

Global prospects for processed fruits and vegetables are favourable, the market is never the less highly competitive, and its important to know where the market is and how to obtain a share of it. Needless to say, the potential export of processed fruits and vegetables is very promising. Kenya is an associated member of E.E.C. and enjoys export privileges to this prosperous market. There is further, a trend in moving certain labour-intensive crops such as pineapples away from areas of high labour and land costs. These operations can be profitably moved to countries with less expensive labour and land costs like Kenya.

The potential for increased production of fruits and vegetables for processing appears promising

in Meru. The district with its varied climatic and soil conditions can grow a wide variety of tropical fruits and vegetables providing a unique opportunity for the processing plants. The processing plants will provide employment opportunities, raise rural farm incomes and provide goods and services to the rural population. Thus the processing plants will have a significant impact to the rural economy.

EMPLOYMENT

It is estimated that the vegetable and processing plant will employ about 500 persons; (Appendix II). These will be engaged in different activities in the processing plant. Hopefully, the persons may be from the district, hence the plant would reduce the unemployment problem by a certain percentage. These persons are the would-be migrants who would be in urban areas looking for unforthcoming jobs.

One starts on the promises that processing plant will create employment at the farms as well. With the availability of guaranteed market, the farmers may be provoked to increase the production. In an effort to increase the production the farmers are likely to hire farm workers to assist with farm activities. Although this kind of employment is seasonal in nature at least it will create

employment for those seriously in need of seasonal employment. From this, it is clear that the processing plant will have a significant impact to the regional economy.

4.4.2 MANGO CANNING

The district has good quality mangoes but there is no canning facilities. Most of the mangoes are sold in the local market or wasted on the farm. A study on canning technology and market is needed. The district also produces a lot of other fruits - citrus passion etc. Hence the canning plant will not be confined to mango canning, but also these other fruits grown in the district.

The production (yield) figures for mangoes and citrus fruits are shown in Chapter 2.

MARKET PROSPECTS

The market for fresh mangoes in France is increasing rapidly and France will probably become the leading consumer of this fruit in Europe in very near future. French imports of fresh horticultural crops from Kenya amounted to 1961 tonnes in 1977, 10.4% of total Kenyan exports which made France Kenya's third largest market in Europe for such produce. The main export item in 1977 was French beans with 1207 tonnes followed by mangoes and avocados with

155 tonnes⁸⁴.

Opportunities for Kenya to export much larger quantities of this fruit to the French market therefore appear to be excellent.

French consumers are very quality conscious and housewives still prefer fresh to frozen or canned produce. Demand is high, even during the European off-season and consumers are willing to pay high prices for top quality products.

RAW MATERIAL SITUATION

It may be noted that a year-round supplies of mangoes does not exist. Kenya's export season lasts from September to June. In order to have a regular supply of raw materials to the processing plant, there is for the plant to diversify its raw materials, so that when there are no mangoes it can use citrus and passion fruits. Also the mango processing plant company can contract with farmers; so that whatever they produce is bought by the company. The processing plant can establish its own production estate. Also the storage facilities are vital in connection with regular supplies to the processing plant and price stabilization.

I.T.C., UNCTAD-GATT : The market for Horticultural products from Kenya in selected European countries, Vol.II April, 1979.

However, the most important method of ensuring that there is adequate supplies of mangoes is to encourage small scale growers to produce more. This can be done through the provision of agricultural inputs, extension services, fair pricing system and proper marketing channels, to growers. Of course, there are numerous incentives which could be offered to small scale growers. Hence increased mangoes production in the district.

EMPLOYMENT SITUATION

The mango canning plant can be located in the medium potential zone of the district. It is the zone where a lot of mangoes are harvested and wasted due to lack of proper marketing channels. The plant will provide employment opportunities to the rural population, especially the people neighbouring the plant.

Although it is difficult to give the precise number of people who will be employed in the mango canning plant, it is projected that it will absorb between 20 and 50 persons to start with.- But as the complex expands it will be able to absorb more persons in the subsequent phases of its development (Appendix II).

Needless to say, the canning plant will create employment, not only in its processing operations, but

also at the farm level. The small scale mango growers will be encouraged to produce more so as to provide the plant with enough raw materials. Subsequently, the small scale growers may decide to employ one or two hired labourers to assist with farm activities. All in all, the mango canning plant will set in motion many other economic activities in the district.

4.4.3 POTATOES

Meru is a major producer of potatoes of the highest quality in the country. The production of potatoes in the district is shown below.

The outlook of the marketing of potatoes both internally and externally is quite promising. The demand for high quality potatoes of Meru is steadily growing and the district is well renowned and in great demand in both local and world markets. With the present production of potatoes there is a need for a processing plant.

Potatoes are a food of increasing importance in Kenya. However, the market is characterised by seasonal and often large supply of fluctuations and there is need for better planning both at micro and macro levels.

According to the study conducted in the leading potato production area in the district, the yields depend on the relative share of potatoes in the farm, production structure and is proportional to the level of purchased inputs. Of course, the improvements on the production methods and the proportion share of area under potato crop depend on the market prices.

TABLE No. 28

POTATO - MAIN PRODUCING AREAS AND ESTIMATED AREA OF LAND UNDER POTATO IN 1975

REGION	DISTRICT	POTATO HECTARAGE (HA)	
		PER DISTRICT	PER PROVINCE
CENTRAL	NYANDARUA	9,000	14,500
	NYERI	2,000	
	KIAMBU	1,800	
	MURANG'A	700	
	KIRINYAGA	1,000	
EASTERN	MERU	11,000	13,000
	EMBU	2,000	
RIFT VALLEY	NAKURU	1,500	4,000
	NAROK	700	
	UASIN GISHU	300	
	NANDI	700	
	KERICHO	-	
	ELGEYO MARAKWET	500	
COAST	TAITA	50	50
TOTAL HECTARAGES FOR KENYA			31,550

Source: C.C. Ballestrem : Report on activities and experiences on potato crops in Kenya, Nairobi, July, 1975.

From this table, it is clear Meru ranks first in potato production in Kenya. Meru and Nyandarua accounted for 63.4% of the area under potatoes in 1975, with Meru alone accounting for 34.9% of the total area of land under potatoes in the country. It is evident that Meru district requires a potato processing plant. The plant will boost district's potential in potato production. A processing plant will not only create employment opportunities, but also will provide goods and services needed by the rural population. Better still the processing plant will raise the morale of the farmers (potato) in so far as potato production is concerned. The plant will act as an incentive to farmers because they will be guaranteed a proper marketing channels for their product.

Currently, the district is the leading producer of potatoes in the country. The district typically produces two potato crops in a year during the short rains season (March-May) and the other during the long rains (September-December).

PRODUCING AREAS IN THE DISTRICT

North Imenti produce well over 75% of the total potato output in the district. Potatoes are cash crop in the division especially Kbirichia, Kiirua and upper Abothuguchi (Katheri area). These three locations account for 84% of potato production from North Imenti. Therefore the three locations are most

suitable areas for locating a potato processing plant.

Over seventy five percent of the people in the three locations are employed on the farms. They are engaged in farm activities like ploughing, sowing, weeding and harvesting of potatoes. The majority of the farmers derive their livelihood from these activities. In upper Abothuguchi (Katheri) they use irrigation methods to grow potatoes during the dry seasons. This ensures that there is a regular supply of potatoes throughout the year. However, due to lack of proper marketing system, small scale farmers grow only what is enough for home consumption (irrigation).

THE POTATO PROCESSING PLANT (PROJECT)

The processing capacity of the plant may be determined by the size of the machine installed. The capacity may be expanded in another two or three phases as the potato growing area is developed. The plant will also encourage the potato farmers to produce more so as to sustain the processing plant.

The location of the plant will be in Kibirichia area of Meru which produces the highest amount of potatoes per year. The area is known for suitable growing of potatoes.

Potatoes will be obtained from small scale growers who can grow potatoes on contract if the company so wishes.

The best, and most probable, potato processing plant may be the one concerned with canning and (dehydration) preservation of potatoes; making potato crisps; or freezing and frozen storage. The plant size to be installed will be the decisions of the processing company in conjunction with the machinery suppliers.

On employment scene, the plant is likely to provide employment to about 800 persons during the first and second phases of the project (Appendix II).

BENEFITS OF THE PROCESSING PLANT (PROJECT)

The benefits of the processing plant include building up export trade particularly to the neighbouring countries. However the advantages are not confined to an improvement of balance of payments. They include employment in the plant itself and other related activities, and the general contribution to the economic growth of the country. In addition there is a reduced losses of food (once processed) during storage, transportation, and distribution and better utilization of by-products or waste products which otherwise tend to be lost. Processed also contribute to the evening out the seasonal fluctuations in the prices of unprocessed or partly processed foods reducing geographical maldistribution of food and helping to lessen the food shortage in years' bad harvest.

Lastly, it will contribute to the improvement in the health of the population by providing a range of nutrition throughout the year especially if the stress is laid upon increasing starch supplies.

HOW TO ASSURE REGULAR SUPPLIES TO PROCESSING PLANT

In order to ensure that the project get regular supplies of potatoes, a number of methods could be adapted:

- (a) to diversify the raw materials used in the processing plant (project).
- (b) to contract with farmers; so that whatever they produce is bought by the processing company
- (c) the processing plant to establish its own production estate.
- (d) Storage facilities
- (e) Crop timing to maintain continuous supply of raw materials
- (f) to offer incentives to small scale farmers, agricultural inputs etc.

In nutshell, the project will provide significant levels of employment for non agricultural workers. However, it is difficult to define precisely the labour requirements for various size of canning installation because this figure is dependent on the nature of the foods to be processed and the processing methods adopted.

4.4.4. TOBACCO

In Kenya, tobacco is grown under the auspices of B.A.T. limited and the tobacco growers Cooperative. All species of tobacco grown belong to a genus of the solanaceae family Nicotiana. The two important ones are the nicotiana tabacum and Nitiana rustica. Nicotiana tabacum is grown widely throughout the world. Meru produces a lot of Nicotiana tabacum tobacco as indicated in Chapter two (Table 15). B.A.T. contracts with farmers so that whatever they produce is wholly bought by them. So due to this regulatory system by B.A.T. the full potential of tobacco production is not utilized. Then one can contend that there is need for tobacco factory; particularly cigarette manufacturing factory in the district. Meru district produces flu-cured tobacco which is the most important tobacco consumed by cigarette industry. The factory will encourage farmers to grow more tobacco, hence more employment opportunities, rural farm incomes and goods and services to the rural population. The district's potential in tobacco production will be exploited. This process will go a long way to raising the standard of living of the rural population.

The classification of tobacco is based on curing methods. Actually curing is the first and most important process for through which raw tobacco is made to fit manufacturing. Essentially it consists

of drying the leaf slowly in order to allow changes in physical and chemical composition. During this process the raw tobacco loses water and its green colour. Curing also results in chemical changes within the leaf structure to allow it to be stored for a period of time before tobacco is used. In manufacturing, cured leaf must be redried and left to nature.

In the district the tobacco curing is done by farmers on their own farms. There are well over 1,000 barns. There are also 1,000 farmers, and each farmer has his/her own barn. The flu-cured tobacco is one found in the district. This tobacco is particularly consumed by the cigarette industry but most of it make pipe tobacco. All the tobacco from the district is sent to Nairobi or Thika Cigarette industries. These industries are owned by B.A.T. limited.

MARKET OUTLOOK

The level of demand is the major factor influencing production of leaf. If the demand is high producers will have a guaranteed market for their leaf at a good price and theoretically maximize their level of production. There are however, a number of other factors such as attraction of other crops, availability and cost of labour and cost of fertilizers

and the cost of fuel. Actually, the market prospects of tobacco and tobacco products can be seen with our naked eyes. The demand for cigarettes and pipe tobacco is extremely high even locally. Millions and millions of kilograms of tobacco are consumed every day in form of cigarettes, all over the world. It appears from the tobacco production figures of the district that there is need for a tobacco manufacturing plant. The market prospects for tobacco and tobacco products is very promising. The tobacco plant will provide employment opportunities to about 20 persons in the first phase. Of course, the plant will also create employment at the farm levels by offering incentives to small scale tobacco farmers. Tobacco is labour-intensive. Actually the number of people employed in tobacco industry are many; such that it is not easy to give the precise figures.

LIVESTOCK BASED PROCESSING PLANTS

4.4.5 TANNING OF HIDES AND SKINS

The production of hides and skins in Meru are shown in Chapter 2. The figures indicate that there is need for a tannery in the district to process both bovine hides and sheep/goats skins for export. One or two tanneries set in the area will serve the whole of Eastern Province and the adjoining districts.

The Government of Kenya is very much aware and concerned about the fact that there is very little value added when hides and skins are exported in raw or semi-processed form. It has therefore been thought wise to encourage the establishment of a tannery that would do the processing of hides and skins to finished products for export and domestic consumption. Such a tannery will be supplied with hides and skins from the rural areas.

MARKET PROSPECTS

The market conditions affect primarily the product and indirectly the technology. They rarely restrict the project scale as such. The demand structure for leather goods and particularly for cattle is governed by the requirements of the footwear, leather gloves and leather garments sectors.

Subsequently, the demands for cattle leather depends not only on population size and national income levels but also on fashion changes and national income levels, and the penetration of substitute materials in the markets for leather manufacturers.

It may be assumed that U.K. imports of goat leather will be maintained at 2,800 and 3,000 tonnes for the foreseeable future ⁸⁵.

85 : United Nations : Manuals for the preparation of Industrial feasibility studies, NY, 1978.

The tanneries deal with leather skin whose raw materials are hides and skins. These valuable raw materials can contribute significantly to the economic and social development of the rural areas. Although figures are not available, there is an indication that a substantial amount of hides and skins are wasted, due to lack of proper marketing system. There are avoidable damages of these commodities in the course of flaying and curing.

The production figures of skins and hides indicate that there is a need for two tanneries in the district. The two tanneries will serve the whole of Eastern province and the adjoining districts of the other provinces. The tanneries will depend on domestic supplies. However, the domestic supplies depend on the extent and type of animal husbandry. Hence in order to get regular supplies of this commodity from the small scale farmers there is need to encourage farmers practice animal husbandry. Subsequently, the tanneries will get enough hides and skins. The tanneries will be located close to dispersed sources of supply to be able to mitigate the effects of poor curing. They will receive the hides and skins before they are spoilt and wasted. Each tannery will require 200 cattle hides per day dry weight averaging 7 kilograms each or equivalent wet salt weight averaging 14

kilograms each. In terms of output each hides yields 6.5 kilograms wet blue shaved weight of upper leather and 2.5 kilograms of wet blue shaved weight of splits⁸⁶. The tannery works one shift per day for 300 days per year. The total time needed for all tannery operations per day is about 10 - 11 hours but each man's working day is only 8-9 hours.

EMPLOYMENT SITUATION IN THE TANNERIES

Although it is very difficult to establish the exact number of persons who may be employed in the two tanneries, there is an indication that well over 100 persons may be employed (Appendix I and II). The processing of hides and skins is labour-intensive. It is normally done in three main stages namely, hides and/or skins preservation (storage); soaking and liming and fleshing. The three stages are labour intensive hence many persons are required in the tannery. For example in the selection stage of the best hides and/or skins more than 20 people will be engaged.

BENEFITS OF TANNERIES

The benefits of the two tanneries - include providing employment to the rural population building

⁸⁶: United Nations (1978) Ibid.

up export trade particularly to the neighbours, improvement of balance of payments, improved rural incomes and the general contribution to the economic growth of the district and the country at large.

HOW TO ASSURE REGULAR SUPPLIES TO THE TANNARIES

The two tanneries will require regular supplies of hides and/or skins for at least 300 days per year. However, in order to ensure that the raw materials are forthcoming from the local supplies, the following methods may be adapted.

- (i) the tanneries to establish their own animal husbandry estates.
- (ii) to contract with farmers;
- (iii) to construct storage facilities, and
- (iv) to offer incentives to small scale farmers, who contribute the largest share of the hides/skins production in the district.

No matter the size of the projects, they will have a significant impact to the regional economy. They will create employment at their operations, as well as at the farm levels.

4.5 CONCLUSION

From the preceding discussion, it is very clear that the district has a high agricultural potential for the development of processing plants (factories). Agriculture is the mainstay of the district's economy. The district has 532,000 hectares of agricultural land where the high potential areas constitute 155,000 hectares. The agricultural activities carried on vary with the potentiality of the land. The main crops grown in the district are: coffee, tea, pyrethrum, potatoes, cotton, tobacco, maize, beans, fruits and vegetables. Also grade cattle do well in high potential zones. Whereas the rest of the zones tend to support only indigenous cattle.

However, the agricultural activities which have the scope for development and do not have processing plants (factories) are fruits and vegetables, potatoes, tobacco, hides and skins. The production figure of these are very impressive. Other crops with significant potential for development are sunflower and pyrethrum (not discussed in this paper). It is evident that there is need for processing plants to process the prospective products. The plants will minimize the loss and wastage of the agricultural products in the district. Also these agricultural processing plants will have a significant impact to the rural economy. Their impact may be seen in

terms of employment creation and raised rural farm incomes.

The second category of agricultural activities which already have processing plants (factories) are coffee (primary processing), tea, cotton, maize milling and dairying. These have contributed significantly to the process of rural development in terms of employment creation, raised rural incomes and provision of basic infrastructure (roads electricity, etc.). Some of the processing plants operate over capacity (cotton ginnery, dairy) and others are just average. The factories operating over capacity are compelled by circumstances to send surplus raw materials to processing plants outside the district (that is milk and cotton). There is spoilage and wastage of milk and cotton when on transit to Kiganjo K.C.C. plant and Mwea ginnery respectively. From this, it is clear that there is need for two extra dairy plants and a cotton ginnery.

Thus the district has a high agricultural potential for the development of processing plants that will provide employment opportunities. However, in order to harness this potentiality the constraints/problems identified should be removed.

CHAPTER FIVE

RECOMMENDATIONS

5.1 INTRODUCTION

This chapter is divided into 3 sections: the summary of the findings, recommendations and the proposals. The proposals are mainly the recommendations in map form, showing the agricultural processing plants which have scope for development in the district; that is, their recommended locations in relation to raw materials availability and accessibility to basic infrastructure.

5.2 SUMMARY OF THE FINDINGS

The findings of this study are related to industrial and agricultural sectors, that's how these have boosted rural development. In terms of providing employment opportunities, raised rural farm incomes and basic infrastructure; in addition to providing goods services needed by the rural population. The focus is on how the two sectors have contributed to the economic growth and development of rural areas taking Meru as a case study. It should be noted that it is difficult to separate agriculture from industry, and vice versa. Agricultural processing factories depend on agriculture for raw materials. Thus agriculture and industry are complementary and depend on each other for inputs. This interdependence of the two sectors makes the findings of the study not to be too rigid on processing plants exclusively. The following were the major findings:-

1. The district has a high agricultural potential. The major agricultural activities which have scope for development of agricultural processing plants are; cotton, tobacco, vegetables and fruits, potatoes, milk hides and skins. The production figures of the products are very impressive. These crops and animals are produced by small scale farmers.
2. The industrial and agricultural potentialities of the district are not fully developed/ utilized, partly, due to lack of and/or inadequate infrastructural facilities (roads etc.) and poor marketing organization of the products.
3. The agricultural processing plants (factories) play a vital role in the process of rural development. This is in terms of employment creation and raised rural farm incomes. Majority of the persons employed (97.5%) in the processing factories were from the areas neighbouring the factories.
4. There was surplus raw materials and usable by-products from the present processing plants, which can be utilized as raw materials for extra new plants (factories) in the district.

5. The proposed plants which have scope for development are likely to employ well over 2,500 persons. Hopefully, these people may be from the district. These people will be engaged at different stages of processing in various plants. However, more people are likely to be employed at the farm levels.

5.3 RECOMMENDATIONS

Kenya is an agricultural country. Eighty five percent of its population is engaged in agriculture in the rural areas. Agriculture accounts for 75% of the country's exports and accounts for over 30% of Gross Domestic Product. Therefore any planning study in the rural areas should address itself to the acceleration of development and hence raising of the standard of the living of the people in these areas with particular emphasis on agricultural development. After all, it is agriculture which provide raw materials to processing plants in the rural areas.

5.3.1. SMALL SCALE PRODUCTION

Farm production forms the most important input in all processing plants both in terms of labour and its effect on the quantity produced. It was indicated that the scale of production in the district is predominantly small scale. Therefore there is need

of encouraging small scale farmers to produce more so as to be able to provide surplus production for the development of processing plants. They will provide employment, raise incomes and goods and services required by the rural population. Improving productivity may be possible by giving incentives to farmers: agricultural inputs, proper marketing channels, extension services, good road network, storage facilities etc.

In terms of actual production on farms, intensive farming is necessary through application of modern farming techniques. These include fertilizers, hybrid varieties and good tendering of crops and animals. These are essential for high yields and good quality crops. One problem which is likely to crop up is with the price of agricultural inputs. There is need to offer cheap prices for these.

5.3.1.1 EXTENSION SERVICES:

The Ministry of agriculture and livestock development to extend services to smallholder farms. The Ministry should re-orientate extension approaches away from the "progressive farmers" approach to an approach which aims at raising the agricultural production in the whole district. The Ministry should strive to reach small farmers and inducing them into the national monetary economy. Also the Ministry should remove their bias towards high potential areas with little regard of medium/marginal zones

of the district. The Ministry should raise the agent/farmers ratio to a satisfactory level; so that the agents reach those farmers with whom they do not necessarily empathise with as [redacted] in the past.

The extension services should be geared towards increasing production in the district. In the long run the district will be self-sufficient in agricultural [redacted] production and be able to supply surplus to the processing plants. Conversely, the processing plants will provide employment to the surplus labour force from agriculture.

5.3.1.2 POORLY MAINTAINED ROADS

One of the factors which have contributed to [redacted] the underutilisation of resources is the poor state of roads; where roads are impassable during the rainy seasons. [redacted] Therefore there is need to improve the access roads in the district. The poor roads hamper the collection of agricultural raw materials from the buying [redacted] posts to the processing plants. A case in point is the "Tea roads" which are impassable during the "flush" seasons. Coffee roads are even worse than tea roads. So there is need to improve these roads so that the performance of the processing factories and small scale farmers could be boosted.

5.3.1.3. MARKETING SYSTEM

The prices of agriculturre produce are determined

by the market forces of demand and supply. Hence the price of agricultural produce is never pre-determined. However, there is need to improve, organize and coordinate the marketing system for the produce. Proper marketing organization for crop policy will act as an incentive to small scale farmers.

5.3.1.4 EMPLOYMENT AT THE FARM LEVEL

In the district with widespread land pressure because of population increase such as Meru, that is also predominantly agricultural in nature, creation of employment could be raised by improving productivity. Improving productivity of small farms may reduce the attractiveness of the town and city. There are various ways of achieving such an improvement some technical and some organisational. The former include the provision of better seeds and larger quantities of fertilizers; the redirection of activities into more valuable crops; the establishment of an extension service to give technical advice; the construction of irrigation ditches and dams. Better credit and marketing facilities. Community development projects that raise farm productivity and, in doing so, provide employment are particularly useful. Where large tracts of land are available, land reform may be the best means of providing employment to rural farm population.

5.3.2.0. PROCESSING PLANTS (FACTORIES)

5.3.2.1 LOCATION

Majority of the people in Kenya reside in the rural areas where they derive their livelihood from agriculture. It is very clear that any efforts directed towards the rural areas are likely to boost rural development (provide employment and raise rural farm incomes). The agricultural processing plants located in the rural areas will not only significantly minimize the transportation costs (raw materials) but will also "take jobs to the people". Thus it is very critical that the processing plants should be ruralized as much as possible. These may be located in service centres.

5.3.2.2. EMPLOYMENT AT THE PROCESSING LEVEL

Creation of employment off-farm is important. The processing plants will absorb labour that cannot find gainful employment in agriculture and create incomes. In this respect the processing provide employment for a sector of the population that would otherwise be unemployed for lack of alternative employment opportunities within the district.

It was indicated in chapter (3) above that processing industries are a significant income earner not only for the families of the smallholders but also for their employees on the farms and processing plants.

However, there is need that employment opportunities in processing industries should be safeguarded by the government, if at all, the Development Goals (of processing plants) is to reduce unemployment problem. The government should formulate a policy which underscores the importance of labour intensive processing plants with a view to offer employment. If there is no such a policy, the foreign investors and indigeneous capitalists will turn to capital intensive techniques.

5.3.2.3 PROVISION OF INFRASTRUCTURE

Very few designated service centres are provided with the basic infrastructure like electricity, telephone and postal services, and water supply). Therefore it is important that all the urban, rural and market centres in the district should have these facilities. In so doing, the processing plants will have access to these facilities their at nearest quarters.

5.4. SUMMARY OF RECOMMENDATIONS

The study analysed reveal that the development situation in the district revolve around the issues of the predominance of agriculture, and very negligible industrial development. It was seen that the ever increasing population pressure on land would further lead to subdivision of the existing smallholder farms, hence the land searcity. Consequently this

will lead to underemployment and disguised unemployment in agriculture. Since unemployment in farming is largely seasonal in character it is logical to look into the possibilities of increasing off-farm employment opportunities during the slack period. Agricultural processing plants (factories) which have scope for development may play a vital role in alleviating this unemployment problem in the rural areas.

It is the author's belief that the future development of the district must aim to develop the agricultural and industrial (agro) potential of the district. This would enable the district to absorb more people on the land (production) and at the processing plants. The recommendations given here upon are prioritized depending on the realistic assessment of the raw material availability for agricultural processing plants.

5.4.1. SHORT TERM RECOMMENDATIONS

Short-term recommendations are those which can be implemented between the present plan period (1984-88) and the 6th Development Plan (1989-1993).

(a) The aim must be to set up those processing plants whose raw materials are sent outside the district, because the existing plants cannot cope with local supplies from smallholder farms (cotton and milk).

There is enough cotton for an extra ginnery; and enough milk for 2 extra dairy plants in the district. The three plants will create employment for about 400 persons in their first phases of development. In fact, they are likely to create more jobs as they expand in their second and third phases.

- (b) There is need to improve and provide basic infrastructure (electricity, telephone services, and water supply) to Timau and Gaitu Market Centres; where the dairy and cotton ginnery plants respectively are proposed.
- (c) Increase the production of cotton and dairy farming so as to be able to sustain the processing plants. This could be done through efficient organization of production and marketing, providing incentives to small scale farmers.
- (d) Improve tea and coffee roads so that they could be passable through out the year.

5.4.2. MEDIUM TERM RECOMMENDATIONS:

These recommendations will involve a period of less than ten years.

- (a) It is evident that agricultural products like vegetables and fruits, potatoes, tobacco, hides and skins are (already, available) raw materials which require processing plants. The production figures and the market outlook for the products are impressive. Hence there is need for the processing plants. The plants will employ well over 2100 persons. Needless to say, more jobs will be created at the farm levels.
- (b) Improve on the access (feeder) roads to most productive areas, so as to ease transportation of raw materials from the buying posts to the processing plants; and the distribution (marketing) of the semi-finished or finished products. Also the distribution of agricultural inputs in the area will be eased. Let the roads be passable through out the year.
- (c) Improve and provide adequate basic infrastructure in the following service centres: market centres; Timau, Githongo, Gaitu, Mitunguu, Kibirichia and Chiokarige: and Kangeta Rural Centre.
- (d) Increase crops and animal husbandry in the district. Extension officers to concentrate on incalculations on better application of fertilizers,

better tending of crops; that better farming methods in general.

- (e) There is need for more storage facilities in the district.

5.4.3. LONG-TERM RECOMMENDATIONS

These involve a period of ten years and more

- (a) There is a lot of overdependence on agriculture; hence there is need to diversify the economy of the district.
- (b) Because agriculture is the mainstay of Meru there is need to assess the possibilities of setting up agricultural supporting industries (fertilizer industry etc.). In so doing such industries will improve the agricultural production, hence raise standard of living in the rural areas.
- (c) Cottage industries should be emphasized; these will create employment opportunities for a quite substantial number of the unemployed persons who might migrate to urban areas to seek employment.

5.5 THE PROPOSALS PLAN (MAP)

The proposals are the recommendations in map form. The map shows the spatial-development model of agricultural processing plants as guided by

- (a) the potentiality of the area in the resource for that the plant has been proposed to process (raw material availability); and
- (b) hierarchy of the designated service centre; and availability of basic infrastructure.
(Map. No. 10).

BIBLIOGRAPHY

1. Ahsan, S.M. et. al - A paper in Rural Development, Growth and inequity, contributed papers at the 19th I.C.A.E., Bruce (ed).
2. Allen, H. - The Informal Urban Industrial Sector and growth: Some Thoughts on a modern in Reynods J.E. (ed).
3. Andreou, P. - Rural and Development Economics, East African Literature Bureau, 1977.
4. Asiz, S. - Rural Development: Learning experience from China, The Macmillan Press, 1978.
5. Aten, A et. al. - Flaying and Curing of Hides and and Skins as a rural industry, Prepared by FAO, Rome, 1955.
6. Central Bureau of Statistics - Statistical Abstracts, 1974, 1979. Government Printer.
7. Central Bureau of Statistics - Kenya Population Census, 1969 and 1979, Government Printer.
8. Chuta, E (ed) ; The Role of Small scale industry in Employment Generation and Rural Development: Initial Research Results from a Sierra Leone, Department of Economics, Michigan State University.
9. Daily Nation, Thursday, January 2, 1986.
10. Darkoh, M.B.K. - "Toward a planned industrial reallocation pattern in Ghana" in Urbanization, National Development and Regional Planning in Africa by Obudho (eds).
11. Edward, E.O. - Employment in Developing Nations - Columbia University Press, 1974.
12. Grundmann, H.E. - Industrial Development in East Africa An appraisal including possibilities for future acceleration, 1971.

13. Gilmour J.M. - "The Dynamics of Spatial Change in the Export Region," in Collins and Walker (eds).
14. Heyer et. al. - Rural Development in Kenya, East African Publishing House, 1978.
15. Hirschman, A.O.-The Strategy of Economic Development, Yale University Press, 1958.
16. Heyer, J. (ed) - Agricultural development in Kenya: An Economic Assessment, Oxford University Press, 1976.
17. I.B.R.D. - Coffee, Tea and Cocoa: Market Prospects and Development Landings, Baltimore, John Hopkins 1977.
18. Isard, W. - Industrial Complex Analysis and Regional Development, The M.I.T. Press.
19. I.T.C.; UNCTAD - The Market for Horticultural Products from Kenya in Selected European Countries - Vol. II, April, 1979.
20. Karani, L. - The industrialization of Kwale District, M.A. Thesis, Department of Urban and Regional Planning, University of Nairobi, 1976.
21. Katsuyama, A. (ed) - A Guide for Waste Management in the Food Processing Industry - The Food Processor Institute, 1979.
22. Kenya; Republic of : - National Development Plan 1970-1974; 1974-1978; 1979-1983, 1984-1988, Government Printer.
23. Kenya, Republic of: Meru District Development Plans, 1970-1974; 1974-78; 1979-1983 and 1984-88, Government Printer.
24. Kongstad, P. - Rural Industrial Development Programme - Kenya R.I.D.P. and Danish Assistance 1975-77, 1977.

25. Kenya, Republic of: Sessional Paper on Employment
May, 1973 (Sessional Paper No. 10 1973)
Government Printer.
26. Langdon, S. - "Export-Oriented Industrialization
through Multinational Corporations:
Kenya," in the world as a company town:
Multinational Corporation and Social
Change, 1976.
27. Mathare et. al. - Tea Industry in Kenya, Department
of Economics Paper, University of Nairobi,
1968.
28. Mbithi, P.M. - Spontaneous Settlement Problem in
Kenya, East Africa Literature Bureau, 1975.
29. Mbithi, P.M. - Rural Sociology and Rural Development
Its Application in Kenya, E.A.L.B.
30. Mbogoh, S.G. - Cooperative Marketing f of Milk:
Options and Opportunities: Department of
Agriculture Economics, University of Nairobi.
31. Mbogoh, S.G. - The Potato Industry of Kenya -
Agricultural Economics Studies No. 1.
Department of Agricultural Economics,
University of Nairobi, 1977.
32. McCarty, H.H. - A preface to Economic Geography -
Prentice Hall Publishers, 1966.
33. Mikkelson, B - "Interpretation of Rural
Industrialization in Kenya" paper in
Dualism and Rural Development in East
Africa, by Leys (ed), 1973.
34. Mukhebi in Rural Development Growth and Inequity
Contributed papers at the 18th I.C.A.E.
Bruce (ed).
35. Mathieson, F.S. - Patterns of Industries - Nelson
Publishers, 1971.

36. Norcliffe, G.B. - "A Theory of Manufacturing Places" in Walker and Collins (ed) Locational Dynamics of Manufacturing Activity, 1975.
37. Nyerere, J.K. - Socialism and Rural Development, Dar, 1967.
38. Obara, D.A. - Environmental and agronomic factors in influencing variations in smallholders yields in the Kano Plains, Kisumu District, Western Kenya; A Ph.D. Thesis, Department of Geography, 1983.
39. Odada, J.E.O.: Capital - Labour Substitution Returns to scale and farm size in Kenyan Sugar Industry, Ph.D. Thesis, 1982 University of Nairobi, Department of Economics.
40. Oiro Okwa, - "The Effectiveness of Growth and Service Centres Policy as an Instrument for Rural Development in Kenya; I.D.S. Working Paper No. 317 University of Nairobi."
41. Omari, C.K. - The Strategy for Rural Developments Tanzania Experience, E.A.L.B. 1976.
42. Ominde, S.H. - Urbanization and Environment in Kenya, 1972.
43. Physical Planning Department: - Human Settlements in Kenya: A strategy for Urban and Rural Development, Government Printer, 1978, Nairobi.
44. Power, J.H. - "The Role of Protection in Industrialization Policy No. 136," in Perspectives on Future Economic Prospects and Problems in Africa by Ghai, D.P. Discussion Paper No. 121, I.D.S. University of Nairobi.
45. Power J.H. ; "Protection in Industrialization Policy with Particular reference to Kenya" East African Economic Review IV:

46. Rado, E.E. - The selection of form four leavers for further education, training and employment.
47. Rado, E.E. - Employment, incomes policy: Kenya's New Development Plan.
48. Raj, K.N. - Linkages in Industrialization and Development Strategy; Journal of Development Planning 8, 1975.
49. Rempel, H. - "Labour Migration into Urban Centres and Urban Unemployment in Kenya" Paper in E.E.K.
50. Renner, G.T. - Geography of Industrial Location, 1947 Cited in D. Smith Industrial Location An Economic Geographical Analysis, N.Y. 1971.
51. Ross, A.E. - Location f of Industries, Q.J.E., 1896
52. Sheffield, J.R. (ed) - Education, Employment and Rural Development, E.A.P.H. 1967.
53. Senga, W.M. - Kenya's Agricultural Sector -
54. Strectew, P -"Industrialization in a Unified D Development and Development Strategy" World Development Planning 1/75.
55. Talburt and Ora Smith - Potato Processing, Westport, Connecticut; The Civil Publishing Company.
56. Uma Lele - The Design of Rural Development Perspectives from Africa - 1975.
57. United Nations Publication - Industrial Development in Africa, 1967.
58. United Nations - Manual for the preparation of Industrial Feasibility Studies, U.N. New York, 1978.

59. United Nations Industrial Development Organisation (UNIDO) Newsletter.
60. United Nations - Planning for Sawmilling Industry in Africa: Proceedings of the Seminar in Arusha.

APPENDIX I

RECORDING SCHEDULE QUESTIONNAIRE ON FACTORY/INDUSTRY OPERATIONS:

- Questionnaire Number -----
1. Name of the factory/industry -----
 2. Location (factory) -----
 3. When was the factory established -----
 4. Structure of the factory -----
 - (a) Agricultural food processing
 - (b) Agricultural non-food processing
 - (c) Others (specify)
 5. Sources of raw material(s) -----
 - (a) Meru district
 - (b) Outside the district
 6. Amount of raw material(s) required per day -----
 7. Scale of production (output per day) -----
 8. Shortages of raw material(s) experienced?
Yes or No -----
If yes, give reasons for the shortages -----
 9. Means of transport for getting raw material(s) -----
 10. Means of transport for distributing the semi-
minished or finished, products to the consumers

 11. Where do you market the product(s)? -----
 - (a) Meru
 - (b) Outside MeruIf in Meru, where (locality) and what quantity -----

12. Averages sales per month -----(Kshs)

13. Total number of employees -----

14. Number of employees in category below

Skilled	Technical	Semi skilled	Unskilled

15. Number of employees from outside Meru -----

16. Total amount of wages/salaries paid per annum
----- (Kshs) magnitude of the payroll.

17. Total amount of wages/salaries paid to those (employee
from outside per annum ----- (Kshs).

18. Initial capital invested (factory construction)
-----) (Kshs)

19. Present operation costs ----- (Kshs)

20. Cost of creating one job within the factory ----- (Ksh)

21. (initial cost of factory/people employed)

21. Amount of energy (electricity) consumed in a day
----- (kilowatts)

22. Amount of water consumed in a day ----- (litres)

23. Do you experience electricity and water shortage?

If yes, give reasons for the shortages -----

24. Other services and/or facilities which are lacking

Do you think they are essential -----

25. (a) Types of (waste materials or) by-products
from the factory -----
26. (b) Disposal methods -----
- (c) In your opinion, Do you think they are usable
yes or no -----
- If, yes, How -----

25. (a) Types of (waste materials or) by-products
from the factory -----

26. (b) Disposal methods -----

(c) In your opinion, Do you think they are usable
yes or no -----

If, yes, How -----

APPENDIX II

TYPE OF INDUSTRY	POTENTIAL EMPLOYMENT
1. Dehydrated vegetables, cabbages, carrots onions, beetroots, mixed vegetables cashewnuts.	Between 300-499
2. Canned vegetables, canned fruits, canned tomato juice, fruit salad	Between 300-499
3. Canned fruits and vegetables	" 5 - 19
4. Canned fruits, frozen and canned vegetables, haricot and cream beans peas; beans in tomato sauce, carrots corn, whole tomatoes, tomato sauce	Over 500
5. Maize miller Wheat flour and maize flour	20 - 49 20 - 49
6. Cotton seed oil and cake; cotton lint, washing soap, ginned cotton, animal feeds	100-299
7. Edible oil, cotton oil cake, Sunflower oil cake, rope oil cake and animal feeds	50-99
8. Tobacco manufacture - Cigarettes and tobacco - Sauff; tobacco	Over 500 5 - 19
9. Fresh milk, dried whole milk power case in dried skim milk powder, evaporated milk, ideal milk, ultra heat treated milk; cheese	Over 500
10. Knitting mills - Knitwear, textiles - Nylon and polyster fabrics; knitting - Cotton lint and cotton seeds	5 - 19 50 - 99 20 - 49
11. Tanneries and leather finishing - leather - skins	20 - 49 20 - 49

Source: Republic of Kenya: Directory of Industries, 1977 edition.