

(i)

THE CONFLICT BETWEEN FISHING AND AGRICULTURAL  
PRODUCTION ACTIVITIES : THE BONDO CASE

BY

AGOT B.E. OBARE

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UNIVERSITY OF NAIROBI

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URBAN AND REGIONAL PLANNING  
DEPARTMENT  
FACULTY OF ARCHITECTURE,  
DESIGN AND DEVELOPMENT,  
UNIVERSITY OF NAIROBI,  
NAIROBI, KENYA.

DECLARATION

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

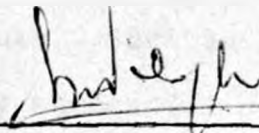
Signed



AGOT B. E. OBARE  
(Candidate)

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

Signed



DR. E. N. NDEGWA  
(Supervisor)

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Finally, I am taking this opportunity to refuse to add as Rodney (1972:7-8) did also refuse that "all mistakes and shortcomings are entirely my responsibility". Taking account of the collective assistance acknowledged above, I am yet to see why I should not agree with Rodney when he contends that "Responsibility in matters of these sorts is always collective, especially with regard to the remedying of shortcomings".

## ABSTRACT

The central concern in this study is to provide some explanation on the apparent conflict between agricultural production and fishing activities in Bondo Division, an area that represents many areas in Lake Victoria's immediate hinterland where agricultural production is noted to be very low. The study argues that although many factors have been identified by many scholars to explain low levels of farm production on the basis of which several measures have been suggested to improve the situation, agricultural production in the study area has remained low even though the same measures have yielded improvement elsewhere.

The argument advanced in this thesis is that there are factors specific to this area which if appreciated would contribute to a better understanding of low farm production in Bondo Division. Because of this area's location relative to Lake Victoria, it is postulated that fishing activities constitute such factors by diverting labour from agriculture and hence leading to low farm production. The study however does not dismiss the other factors identified by the previous scholars as having no relevance to the study area. The study set out to find the extent to which fishing activities affect agricultural production and

also whether the other factors also have any bearing on farm performance in the study area.

A survey was undertaken using structured research schedules which were administered to two separate samples of households resident in the study area as well as to fishermen and fish traders. The research instruments were then categorized into three household groups for comparative analysis to test the postulated relationship between fishing activities and agricultural production

The study finds that fishing activities have significant influence on the low levels of farm production because the labour that is diverted to such activities is never compensated for in agriculture by investment of part of the earnings from fishing activities to the agricultural sector. However, the study further finds that even if such compensation was to be made, farm production would still be significantly low in relation to the established farm potential. This supports the finding that the other factors identified by the previous scholars to explain low agricultural production still remain relevant to the study area. The study argues that the factor of agricultural finance underlies the said identified factors. The avenue open to the small farmer to improve his lot is therefore the credit facilities which, it is argued in this study, are practically inaccessible

to him. The big issue is therefore how best to improve the poor financial base of the small farmer.

Because the small farmer is unable to use even the available credit facilities due to the collateral terms set by the financial institutions, the study recommends, among other things, that selective credit facilities which pay special attention to the predicament of the small farmer by offering credit on 'soft' terms should be introduced in the study area. The study has also recommended the development of other sources of local resources which can generate supplementary finances to this end. Agro-Fisheries cooperatives are therefore suggested as a means of tapping the lake's resources and channelling part of the earnings from fishing to the agricultural sector for farm improvement. This, it is argued, will also help in minimizing the conflict between fishing activities and farming.



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## CHAPTER ONE

### INTRODUCTION AND BACKGROUND

#### INTRODUCTION:

#### PROBLEM STATEMENT

A number of studies have established that low levels of agricultural production is a lingering problem in many parts of rural Kenya. Given the fact that 80% of Kenya's population lives in the rural areas and that the majority of these rural dwellers depend on the agricultural sector as the source of their livelihood, this realization becomes crucial. The fact that out of the 44.6 million hectares of land in Kenya only 8.6 million hectares (19.3%) is of medium to high potential in terms of agricultural productivity means that it is only this portion of land that can be brought under effective agricultural production. The proportion of Kenya's population that is living in the rural areas has therefore concentrated in the 19.3% agriculturally productive land making the situation even more acute.

Given the above scenario of the land's agricultural productivity vis-a-vis the population dependant upon it, the expectation would therefore be that this 19.3% of the country should have its agricultural activities organized in such an efficient

and effective manner that maximum agricultural production is realized. But the question which remains begging is the extent to which we can match this expectation with reality.

The Lake Victoria's immediate hinterland defined in terms of the administrative locations that border the lake constitutes part of the medium potential regions of the country. Despite this agricultural potential, this area is typical of places which have specifically low agricultural production and where incomes as well as the general standard of living have remained low. Akungo (1980) concurs with Ocharo (1977) in establishing that agricultural production in this region is low : the average net farm income in South Nyanza District in 1980 was estimated to be Kshs. 1664. Akungo (op.cit.) notes that this is low and being the district's average, it is to be expected that some areas in South Nyanza have definitely lower incomes.

Siaya District, which is one of the districts within the Lake Victoria hinterland also exhibits intra-district variations in terms of climate and soils. Consequently its average income per capita from crop earnings of Kshs. 616 in 1982 (Siaya District Development Plan 1984/88) could be appreciated within



the same argument as the one advanced for South Nyanza above. This implies that areas like Bondo Division which lies within Siaya District and which is characterized as lower agro-economic zones have much lower incomes. What is being said here in effect is that monthly per capita incomes from crop earnings are Kshs. 139 for South Nyanza and Kshs. 51 for Siaya District and that in some parts of Siaya district the figures are definitely lower.

If agriculture still continues to be the basic source of incomes in these areas, and this is likely to be the case, these figures should be loud enough about the dire need to focus concern on factors related to agricultural production in this region.

The studies that have been carried out, however, have identified factors that have been postulated to explain the low levels of agricultural production and ventured to propose measures that could be taken to raise the level of farm production. The studies carried out in areas of low agricultural production have isolated factors such as inadequate knowledge and limited use of modern farm inputs; low awareness of the existence of and apathy to co-operatives and credit facilities; inadequate and ineffective extension

services; small farm sizes both in terms of the total holding and the proportion of the parcel actually cultivated; inadequate and poor transportation facilities as well as poor farm inputs delivery systems; under-developed marketing facilities and outlets and physical constraints like poor soils. These will be presented more elaborately in the next Chapter.

In Kenya, the government has addressed itself to these problems by instituting various measures as reflected in the National Development Plans (1970/74 to 1984/88). Such measures have been in the form of promotion and development of farmers' co-operatives, spreading out of credit facilities to farmers and injection of more investment capital into the concerned financial institutions, training and deployment of more agricultural extension officers, adjudication and consolidation of land holdings, operation of seasonal credit scheme and so on.

While programmes such as the ones referred to above have been tried in the past two decades or so in an attempt to provide solutions to the problems identified, these programmes have not always been invariably successful in improving agricultural production in every place where they have been tried.

There are therefore specific areas like the Lake Victoria's hinterland where, despite the operation of these programmes, agricultural production has continued to be quite low- this is of course contrary to what would have been expected on the basis of the improvements in agricultural production realized elsewhere (e.g. in Kisii - Omare, 1981) where the same programmes have been operational for the same length of time.

The foregoing stated discrepancy between the expected and actual agricultural production in this area raises one basic question : If the same measures have been applied elsewhere with satisfactory effectiveness, why are the said areas still lagging behind in agricultural production? A number of possible answers could be postulated for this question. First, some areas might be characterized by peculiar environmental/ecological settings that do not necessarily relate to the majority of the rural areas and which therefore constitute added factors that could explain continued low agricultural production even if the already mentioned 'conventional' measures have been instituted. Second, these areas might have activities which are locality-specific that offset the steady and balanced application of the prescribed measures and solutions so that inspite of the efforts made to

raise the performance of the agricultural sector, levels of agricultural resource utilization remain low. This could be compounded by an attendant possible explanation, namely that incomes from the non-agricultural activities is not adequately re-invested in agricultural activities to commensurately pay for the attention which the former divert from the latter

This study has been focused in Bondo Division, an area which continues to register low agricultural production even though several corrective measures have been undertaken. Moreover the division has its own peculiarity by virtue of its location next to the Lake Victoria. It is therefore likely that the fishing activities may require a significant and at times even overriding consideration in deciding how resources such as capital and human labour are allocated in relation to agriculture.

A number of studies that have been carried out in this region and other similar settings (Akungo, 1980; Ocharo, 1977; McHenry Jr., Moody, 1963; Keruhanga, 1979; etc.) all agree that fishing is an activity that thrives alongside agriculture on the hinterlands of many water masses. Akungo (op.cit.) found that in Mbita Division of South Nyanza, 29% of the people supplemented their farm incomes with fishing. This

income from fishing contributed 25.6% of the formers' total incomes. Keruhanga (op.cit.) established that 80% of the fishermen on Lake Victoria were involved in other occupations besides fishing the most common of which was agriculture.

The above studies have established a definite link between fishing and agriculture but only in so far as pointing to the fact that people resident in Lake Victoria's hinterland and similar settings elsewhere engage in both fishing and farming and that family incomes are mainly derived from the two, thereby reflecting the complementarity of the activities. Such studies as have been undertaken (whether on agriculture or on fishing or on both) have tended to be unidirectional in their orientation in the sense that they have only treated these activities as exclusive sectors usually laying stress on the incomes that accrue from either farming or fishing but without establishing the influence that any of these activities could have on the other - there has not been any comprehensive study of the relationship between these two activities in terms of how engagement of one influences the other. Jul-Larsen (1981) had recognized this lack of systematic assessment of the influence but he did not delve into a study of such a relationship in fear of

getting unreliable data.

This study recognizes, like the rest of the studies before it, that there is unquestionable link between agriculture and fishing in the manner articulated by the said scholars but the elemental substance of this study starts on the premise that they have just underscored and tested in various areas the same commonly held and broadly generalized factors and solutions related to agricultural production : the kind of factors and solutions that on the basis of their over-generalization for wide rural areas therefore fail to capture the very unique local circumstances characterizing Bondo Division as a unique area.

It is assumed in this study that Bondo Division has been subjected to measures which have yielded improvement elsewhere. This being the case, it is likely that the continued low agricultural production could be explained by other factors specific to this area that impinge on the performance of the agricultural sector. It is the thesis here that fishing activities might constitute the specific factor. This influence is held to be specifically exerted by the labour shortage and farm neglect since it is probable that labour is diverted to fishing engagements at the expense of agriculture.

The labour force shortage mentioned above should be appreciated in perspective since as early as 1970 it was found that 17,600 fishermen were operating on the Kenyan side of Lake Victoria (Jiwani, 1972) and that "peasant-fishermen" were found to devote two days a week to agriculture (Keruhanga, op.cit.). Since most of the fishermen come from the immediate hinterland of the lake, an area which records very low agricultural production, it is hypothesized that this has a bearing on the agricultural sector's performance.

The above hypothesized influence of fishing activities upon agricultural production also hints at the fact that income from fishing is not commensurately re-invested in agriculture to compensate for the labour diverted from agriculture to fishing activities and thereby correct the imbalance so created. If this were so, then the results would be reflected in high levels of agricultural production.

The primary task in this study is therefore to systematically assess and answer the question: to what extent is agricultural production in Bondo Division influenced by fishing activities in terms of the labour and income drawn from agriculture? The basic assumption in this study is that because fishing activities

presently draw a significant amount of manpower from agriculture without adequate correction of the imbalance so created, solution can only be sought in the efficient and effective organization of the former to yield optimal income to the fishermen so that a higher level of such income could be re-invested in agriculture to boost production and thereby ensuring the sustenance of the two activities. The study also concerns itself with the manner in which these two activities can be so effectively and efficiently managed as to enable the same households to functionally and profitably operate in both.

#### STUDY OBJECTIVES

The objectives of this study are therefore:-

- (i) To find out the present and potential level of agricultural production as well as the current and expected levels of income from crop earnings.
  
- (ii) To establish the amount of labour from the focal area that is engaged in the fishing activities as well as the specific sectors to which such labour is diverted and the incomes derived from them.



- (iii) To find out how much (if any) of the income obtained from fishing activities is invested in agriculture.
- (iv) To find out the extent to which agricultural production in Bondo Division is a function of fishing activities in terms of the labour and income drawn from agriculture to fishing activities.
- (v) To find out whether the postulated conventional factors held to hamper agricultural production have any bearing on Bondo Division.

#### HYPOTHESES

- (i) The level of agricultural production is influenced by the size and age/sex structure of the labour-force that is diverted from agriculture to fishing activities.
- (ii) The level of agricultural production is influenced by the amount of earnings from fishing activities that is re-invested in agricultural activities.

## ASSUMPTIONS

- (i) Given the rural nature of the study area, it is here assumed that the local labour is agricultural and any diversion of such manpower to any other activity aside from agriculture can only be done at the expense of the latter.
- (ii) It is also assumed that the 'conventional' factors referred to in objective (v), if found to be applicable to the study area, also owe their applicability to the labour diversion and the subsequent neglect of the agricultural sector should hypothesis (i) be found to hold.
- (iii) It is assumed that the fact of the study areas classification within the district as belonging to the lower agro-economic zone cannot significantly explain the low levels of agricultural production there - that if any sufficient attention was given to agricultural activities by applying the remedies suggested by the scholars of agricultural development, and the gap created by fishing activities on the agricultural sector was bridged, then the study areas low agro-economic conditions are easily surmountable.

## SCOPE OF THE STUDY

It is already clear from the sections above that this study does not intend to delve into agricultural production activities by way of elaborately assessing factors surrounding their performance as the area of central focus. It neither intends to do the same for fishing activities. It is believed in this study that nature of treatment of agricultural production and fishing activities has been satisfactorily done by a considerable number of scholars as will be seen in the next chapter. This study will therefore only dwell on the variables that make up the relationships hypothesised above between the two sectors - the relationships that define the earlier stated conflict. In fact it is the manipulation of these crucial variables that constitutes the essence and therefore necessary scope of this study. Other factors, especially those related specifically to objective (v) above, will be given general treatment only in so far as they help to establish the broad framework within which the critical factors/variables can be appreciated and also as they help to fulfil the stated objectives.

The core variables which will be given considerable attention in this study are agricultural production and earnings accruing from agriculture; the portion, age/sex

structure and quality (education and training) of the labour engaged in fishing and agricultural activities; earnings derived from fishing activities and what proportion of these earnings are invested in agricultural production activities; proportion of family farm holding under cultivation and also daily hours as well as weekly days devoted to farm work by those in fishing. The fundamental scope of this study therefore only consists in using the above variables to establish the hypothesised relationships and using whatever findings to deduce any implications with regard to planning policy and further research.

#### OPERATIONAL DEFINITIONS

- (i) Fishing activities - both catching fish and trading in fish.
- (ii) Agricultural production - crop yield in 90kg. gunny bags. In this study the crops considered for this measurement are maize and millet, these being the most basic staple food crops in the study area.
- (iii) Agricultural production activities - any engagement on the farm for the purpose of or/and which actually produces crop yield.

(iv) Influence - any relationship confirmed by at least 20% frequency distribution of population will be considered to exhibit an element of influence depending on the manner the focal variables are postulated to relate to each other. Although this percentage is categorised in statistics as showing only a "slight relationship", this study considers even this level of relationship as enough to start occasioning concern among planners. This is under the contention that planners should respond to problems in their earliest stage of manifestation if not before they actually appear.

(v) Conflict - When influence is established and there is a significant difference between the number engaged in fishing activities and the number who remit money home from fishing activities or a significant difference between the money remitted home and the proportion of it invested in agricultural production activities or if there is any difference between the money from fishing activities invested in

agriculture and the gap created by the former in the latter. Significance here will also start at the 20% margin on the basis of the argument in (iv) above.

(vi) Present level of agricultural production - amount of crop yield accruing from the portion of the farm plots presently cultivated using present farming methods.

(vii) Potential level of agricultural production - amount of crop yield which could accrue from a unit of land in the study area if whole plots were cultivated with present farming methods and if all the productive members of the household were engaged in farming. Potential if the recommended farming methods were used cannot however be precisely computed because the level and manner of application of such methods would vary very widely between farmers. The present farming methods will become clear at the end of Chapter Two and Chapter Four.

(viii) Current levels of income from crop earnings - derived from (vi) above and determined by

local crop sale mechanisms to be presented in the next Chapter and Chapter four.

- (ix) Expected levels of income from crop earnings - derived from (vii) above and determined as in (viii) above.
- (x) Bearing (as used in Objective (v) - if 20% or more of the population is distributed in a manner that they confirm that the factor in question applies to the study area.

It should however be noted that corresponding production and earnings figures for fishing activities will be determined in the same manner as those in agriculture presented above.

## BACKGROUND

### THE STUDY AREA

In this last section of the Chapter, it is imperative that the study area is introduced in terms of its position, physical background, climatic and vegetational characteristics, geology and soils. The introduction of such a background at this stage will provide the reader with the necessary knowledge

in terms of the study area's natural land potential and therefore the levels and variety of what could be produced. It is within the context of such knowledge that one should appreciate the issues that are to be discussed in the coming chapters.

The study area, Bondo Division, is located in Siaya District, Nyanza Province of the Republic of Kenya. Geographically, Siaya District extends from latitude 0 degree 13 minutes south to 0 degree 18 minutes north and from longitude 33 degrees 58 minutes east to 34 degrees 33 minutes east. Map 1 is a representation of the area in its national context.




Within the district, as shown in Map 2, the study area is bordered by Lake Victoria in the south to south-west, Busia District in the North-west, Boro and Yala Divisions in the north and Rarieda Division in the east. Map 3 shows the administrative units of the study area and some physical features as well as centres and road network. The study area lies in a region that is categorised within the country as of medium potential in terms of agricultural production. This implies that the area is capable of producing high yields of a variety of crops other factors being equal.



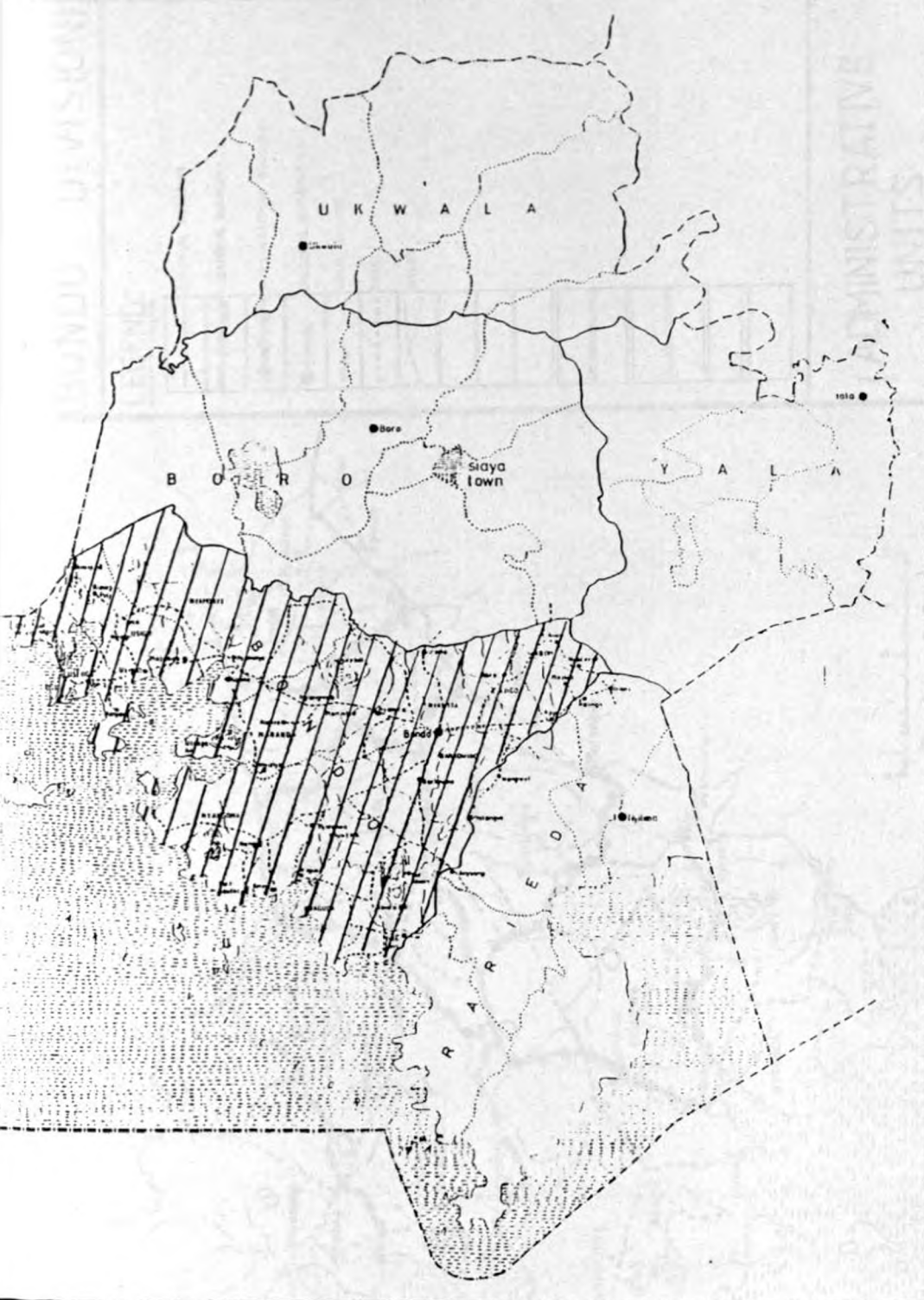
# STUDY AREA : NATIONAL CONTEXT



**LEGEND:**

-  DISTRICT
-  SIYAYA DISTRICT
-  STUDY AREA

# STUDY AREA: SIAYA DISTRICT CONTEXT.



DISTRICT BOUNDARY	●Hajiwa	LOCAL CENTRE / VILLAGE	
DIVISIONAL BOUNDARY	-----	ROADS	
LOCATIONAL BOUNDARY	~~~~~	RIVERS / LOCAL STREAMS	
SUB-LOCATIONAL BOUNDARY	////	STUDY AREA	
DIVISIONAL HEADQUARTER			

# THE STUDY AREA (BONDO DIVISION)

## LEGEND:

	DIVISIONAL BOUNDARY
	LOCALITY BOUNDARY
	SUB-LOCALITY BOUNDARY
	DIVISIONAL HEADQUARTER
	LOCAL CLIFF
	ROADS
	RIVERS

## ADMINISTRATIVE UNITS



0 1 5 10  
Scale 1:300

The division has a land area of 574 km.<sup>2</sup> which is divided administratively into three locations and fourteen sublocations as seen in map 3 as per 1979 census boundaries. These administrative units have however long been revised but the old boundaries will be used in this study because they are the units into which most available data is broken down; especially population statistics which as will be shown later in Chapter 3 become very crucial in sampling.

### Physical Background

The division lies within the Lake Victoria Basin. The most conspicuous topographical feature of the division is the relatively low relief with gentle slopes towards River Yala which bounds the study area in the north and towards Lake Victoria in the south. The general ground elevation fluctuates by only tens of metres rising from about 1140 MSL on the lake shore in the south to about 1180 MSL in the northern River Yala boundary. However scattered hills rising to about 1280 MSL occur near the lakeshore in parts of south Sakwa and Yimbo locations. These areas include Ramogi hill and Usenge hill in Yimbo location and Abiero, Nango and Serawongo hills in south Sakwa as presented in Map 3. Gobei in the norther part of the division is exceptional because it is the highest area standing at an altitude of 1356 MSL.

The only prominent river here, River Yala, drains into Lake Victoria just like the other smaller rivers and streams most of which are intermittent and only of local importance starting from inland and flowing over short stretches only. Map 3 shows a network of such small rivers and streams.

The terrain presented above does not therefore exhibit any rugged mountaneous characteristics that can impair agricultural practice and hamper production just as the drainage system in the study area does not allow for any water logging that can pose any danger to farm production. Only the Yala Swamp was a threat to cultivation around the mouth of River Yala but this has been drained by the Lake Basin Development Authority and the reclaimed land put to productive use.

### Geology and soils

Geologically, the division is generally covered with lava deposits that occured from repetitive volcanic eruptions and sedimentary rock formations of the Kavirondian rock type or Nyanzian rock system. Both are not good in retaining water due to impermeability and the prospect for underground water in the division is very poor.

The surface soil is mostly not very deep and generally reflects a volcanic origin of varying structure and texture together with loose alluvial and silt and sandy murram. Granite boulders and conglomerates are common near the areas of several storm streams like Nyandera, Ochok, Alara, Ndate and so on.

The geological nature of the study area and the lean character of the soil mean that for a successful agricultural season, the area needs heavy and properly temporally distributed rainfall. This is because the shallow soil cannot retain enough water for the crops and the underlying rocks aided with the presented drainage terrain will ensure that the water is not retained long enough for the crops. This basically explains why the division much depends on the single season that coincide with the long rains for effective agricultural land use. The volcanic origin of the soil however can make it able to yield enough crops to sustain the households through the year.

### Vegetation

With the exception of Abom and Ajigo sublocatons in the north-eastern corner of the division, the vegetation in Bondo is characterized as bushy savannah and scrubland. This results from the lean nature of the top soils and the concentrated pattern of annual

rainfall which leaves most of the year not very wet. Indegenous trees which are commercially insignificant are found widely scattered within the dwarf shrubs that predominate.

In Abom and Ajigo sublocations, there is a marked departure from the above character of the vegetation. Given the fact that it is a transitional region that gives way into Yala Division which is wetter, cooler and relatively more fertile, the vegetation is significantly boosted and perennially green as opposed to the southern areas defined above.

### Climate

The climate prevalent in Bondo is the hot equatorial type but temperatures are known to be lower during the rainy seasons than during the hot seasons. The daily temperatures depict a diurnal variation from a minimum average of 15°C at night to a maximum average of 30°C during the day.

Rainfall amounts and distribution are largely determined by the altitude and wind direction. The altitude is already presented in the relevant section above but the wind pattern is of south westerlies between December and May and north easterlies between



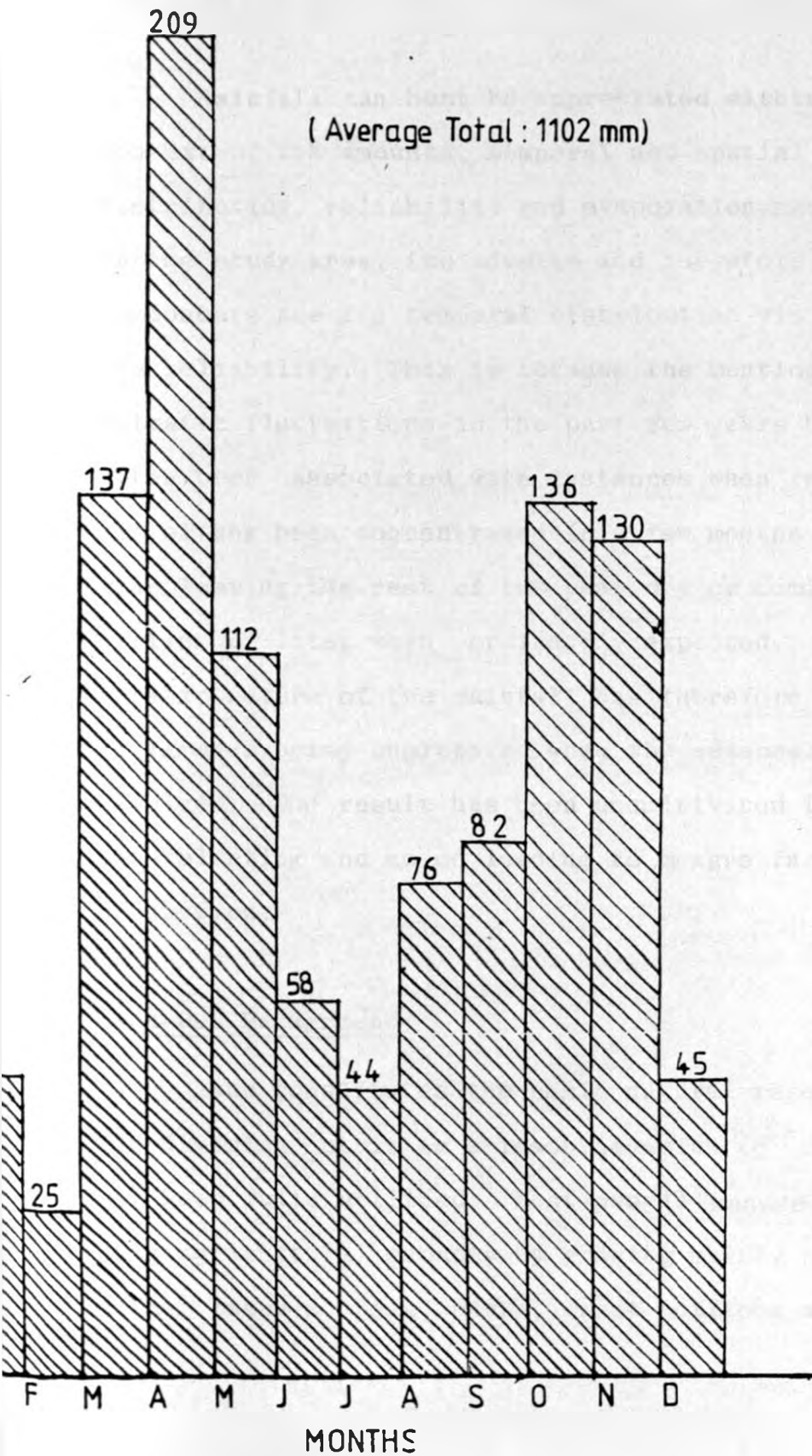
July and October. The wet seasons therefore have their peaks in April and November while the dry seasons have theirs in January and July. This pattern is the regular one not taking account of the climatic fluctuations which have been experienced in the past few years starting from 1981.

The area experiences a mean annual rainfall of 1102 mm and this plus the soil types therefore make it of medium agricultural potential. Chart 1 shows the distribution of rainfall and represents figures taken from Bondo Weather station between the years indicated. There might be a slight variance between the rainfall figure given in the chart and those found in other sources, e.g. the 1066 mm figure given by the Ministry of Water Development in Kisumu, but this could be due to the yearly climatic fluctuations and the fact that the latter figures are based on wider spans of time. Otherwise the difference are insignificant.

The area receives lower rainfall than other areas of the district and most of its rains are of convectional type. The low relief topography is the major factor influencing the area's low amount of rainfall. The average rate of evaporation is



Part 1: AVERAGE ANNUAL RAINFALL (1983-1986)



SOURCE: BONDO WEATHER STATION (MWD).

about 5.4 mm per day while the relative humidity varies from 67% to 44%.

Rainfall can best be appreciated within the context of its amounts, temporal and spatial distribution, reliability and evaporation rates. In the study area, its adverse and therefore crucial components are its temporal distribution vis -a-vis its reliability. This is because the mentioned climatic fluctuations in the past few years have often been associated with instances when rainfall has either been concentrated in a few months of the year leaving the rest of the year dry or coming earlier or later than ordinarily expected. This erratic nature of the rainfall has therefore resulted in farmers being unprepared when the seasonal rainfall is received. The result has been uncultivated fields, late planting and so on leading to meagre farm production.

#### Land-Use Background

Land constitutes the basic natural resource in the division but it is a resource which to date has not been fully utilized. Most people manage a non-cash agricultural economy by growing mainly sorghum, maize, cassava, peas, beans, sweet potatoes and

groundnuts for subsistence. The fruits which are also grown include mangoes, guavas, bananas, pawpaws and oranges. Cotton is the only established cash crop grown but sometimes part of the harvest of maize, beans, millet as well as groundnuts may be sold off for cash. Coffee is however in the process of being introduced as a cash crop in the study area.

All the above activities are undertaken on only a small portion of the available farm holdings with the result that much of the land still lies unutilized under bush. The result is that most of the people have low incomes and are therefore unable to adequately invest in modern farming technology that would help raise their farm incomes and therefore living standards. The discussion on land use in the study area is however more fully presented in Chapters Two and Four.

## CHAPTER TWO

### LITERATURE AND POLICY REVIEW

#### LITERATURE REVIEW

##### AGRICULTURAL PRODUCTION:

The subject of agricultural production has, and most rightly so, been at the centre of a multiplicity of researches as well as donors' concern and has also been given priority attention in national policy. This has been particularly true in the so called "Less Developed Countries" (LDC's) where agricultural activities, and mainly small scale farming, have hitherto been the mainstay of the economic well being. The position of agriculture in such economies, of which Kenya is no exception, is already highlighted in the opening paragraph of Chapter One and need not be amplified here again.

What is noteworthy at this stage, and which has also been said earlier, is the fact that this study is similar to those before it in so far as it takes cognizance of the crucial role agriculture plays in such economies and therefore the significance of the subject of agricultural production. The approach given to the treatment of the same subject is however different in this study. In the study area, fishing

also comes closer to agriculture as an economic activity but also as a factor that has a bearing on agricultural production. This contention has been outlined before but it is what essentially designates this study as necessarily different from the others - it is this perspective which specifically constitutes the academic niche which this study claims.

In this section there is going to be an assessment of some of the factors that have been isolated and presented by a number of scholars to explain low levels of agricultural production both within Lake Victoria's hinterland and in the rural areas of Kenya generally. Next to be looked at are fishing activities which the author argues constitute an ignored factor that impringes on agricultural production through its diversion of resources such as labour and finance. This means that although the two variables could by their own right become impediments to farm production, they will be accorded special focus here due to their capacity as intervening factors as well through which fishing activities are postulated to exert their influence on farm production. To be treated here are also policies relating to the two activities. Attempt is also made to synthesize both the previous findings and the said policies to see if there have been any linkages and

coordination in research and policy formulation with regard to the activities. These will help to establish the gap that exists and therefore make possible the derivation of the hypotheses on which the study is based and which have been outlined before.

The concept of 'agricultural production' has been operationally defined in the previous chapter but it can be understood even further here when one looks at it in terms of the definition offered by Chauhan (1966:88). He says "In the study of productivity in relation to land utilization a distinction has to be made between --- the ultimate basic capacity and the capacity in use, or in actual practice. The latter is generally lower than the former, but it is more relevant. In regard to this, two terms are ordinarily in use: 'fertility' --- (natural productivity), and 'productivity' --- (fertility plus added factors or improvements). Besides, productivity must be distinguished from production or output; the former refers to capacity and the latter is an objective expression of it." The earlier offered operational definition should be seen to fit within the framework of this conception of agricultural production.

FACTORS AFFECTING AGRICULTURAL PRODUCTION:

It has already been said that very many scholars have studied the issue of low agricultural production especially with regard to the factors that might explain the phenomenon. These studies have been undertaken in a wide number of places - the Lake Victoria's hinterland (Ocharo, Akungo, etc.), Kakamega (Wanga), Ukambani (Mbithi), Uganda (Kyamanywa), Tanzania (Kamurali, McHenry Jr. etc.), Kikuyu (Kinyanjui) and even internationally (Hardiman and Midgley). But one of their most striking aspect which this study finds is the fact that they actually agree on quite a number of factors that they hold to influence the level of agricultural production. A number of these factors will be examined here but the focus will be on maize and the small scale farmer as the most dominant staple food crop and farm operator respectively in the study area. Each factor will be treated in turn.

Farm Technology:

Gwyer (in Amann, 1974:94-138) considers such issues as improved seeds, farm machinery and equipment, fertilizers, pesticides and herbicides under the broad categorization of farm technology. The other scholars

who have treated the same variables in their studies have however not necessarily done so under the same classification but there is considerable agreement in their discussion of the same.

Mcloughlin (1967:21-22) says that the maintenance and development of land resources - given the food needs of a population growing annually at the rate of about 3.8% and the use of an increasing share of the better land for export crops - there is a growing need to maintain the productivity of land resources. Increased emphasis must therefore be placed on the maintenance if not the increase of long run fertility of soils now in use. The author should also have emphasized the need for a definite bias towards other forms of farm technology like the use of improved seeds with its associated package of other improved farm practices which call for the use of pesticides, increased labour and appropriate forms of farm machinery.

Gwyer (op. cit.: 100) is more articulate in the argument for farm technology. He says crop intensification increase employment capacity of small scale agriculture on top of increasing food production. The purchase and application of material inputs by farmers raises both crop output and increases labour demand. Hybrid maize



both requires more labour inputs than ordinary maize and through higher yields it also offers small farmers subsistence needs on a reduced acreage - leaving a greater proportion of the farm to non-food crops which multiplies employment capacity of small scale agriculture.

The use of material inputs like fertilizer and insecticides, through raised crop yields, increases labour demand not only at harvest times, but raises the marginal productivity of labour in such operations like weeding. Gwyer (op. cit. : 132) continues to contend that "it is through extra production of hybrid maize too that stabilization of food markets is likely to come, which is the 'sine qua non' of cash crop specialization by the very small farmer."

The same scholar (1.153-155) talks of Type One technologies (output and employment increasing like fertilizers, improved seeds, etc.) and Type Two technologies (also output increasing but employment destroying like herbicides and certain types of farm mechanization). Type One technologies increase employment by an output effect (more harvesting labour), an application effect and a productivity effect (by raising labour's productivity in land preparation and weeding in the case of fertilizers). Type Two technologies

may have the above three effects but in addition a labour substitution effect.

The author points out that in some cases the negative substitution effect may be sufficiently great to overcome the first three positive employment effects. However, in situations of labour scarcity, whether local or seasonal, the positive output effects of Type Two technologies will include area under cultivation, as well as yields and therefore will very likely have an overall positive effect on the level of employment.

An assessment of crop intensification and farms technology especially as they relate to the small scale farmer should however be done within the framework of Hardiman's and Midgley's (1982:105-106) observation that "so far, these improvements have mainly benefited the richer farmer, and have tended further to distort the distribution of gains to different groups in the agricultural sector . --- In theory, the new 'miracle' high-yielding varieties of seed are scale neutral, and thus should benefit all farmers, but in practice their use requires a package of inputs that is beyond the reach of the small farmer. High-yielding varieties of seed need chemical fertilizers, pesticides, a reliable water supply and an agricultural extension

service to impart knowledge of their use. These inputs are expensive, so that the farmer without capital can only obtain them through receiving credit." The accessibility of such credit facilities for such small farmers will be looked at later in this chapter.

However, from the above, the role of farm technology in raising agricultural production is apparent. The tying of improved production and farm employment or stabilization of food markets as done above is important because either way, there is still a multiplier effect that finally pays back to farm production, i.e. farm technology increases employment capacities through raised productivity and more employment inflates production which affords further intensification and even more employment chances and so on. The application of farm technology in the study area must however be assessed against the background of the small scale farmer who predominates there and his ability to afford the package given his level of income (to be seen later) or the ease with which he can use the available credit facilities.

#### Cropping Pattern:

The manner in which crops are planted in terms of spacing and mixed vis-a'-vis single cropping has a

definite effect on crop yield. Ruigu (in Amann, op. cit.: 326) points out that productivity is a function of crop mix. Gwyer (op. cit.: 104) says such interplanting (usually common with food crops) varies in extent from place to place and, apart from influencing productivity, concurs with Ruigu that it also results in equally marked difference in annual labour inputs. The fact that the cropping pattern influences yield and labour engagements means that it also has implications for rural incomes and its variation from place to place. Sound cropping pattern for each crop therefore becomes a useful consideration in any attempt to bring agricultural change that will have meaningful impact on incomes, food security and agricultural employment.

The paradox is however that while such unsound cropping pattern has the said adverse bearing on farm production and therefore incomes, the small scale farmers have often resorted to the same farm practice with an aim of maximizing, within a given season and farm holding, their crop yields and subsequent incomes.

#### Agricultural Extension Services:

It is useful to start here with an opening contention in the words of Uchendu and Anthony (1975:46)

that "No matter how effective technical advances are in themselves or how they modify the environment, they will fail in their primary objective of achieving increased productivity unless the prime mover of the agricultural change, the farmer, is able and willing to manipulate them". The willingness and ability or motivation and skill acquisition of the farmer to effect such change depend on both training and economic incentive. For the time being we are concerned here with his training and education on farm practices which rest on the extension services in terms of their availability and effectiveness. Such services become even more critical for agricultural improvement in a rural setting like Kenya's where the level of literacy among small scale farmers is still considerably low. It is however important to first understand the underpinning principles of effective extension work. Savile (1965: 1-9) presents one of the most able arguments on this and this section will depend considerably on him.

Savile says that in the early colonial departments of agriculture, advisory services were established to explain to farmers what they should do to increase output from their holdings to realize the government's objective of increased agricultural production. These advisory services, he rightly says, were often wrongly

referred to as 'extension services'. They were not extension services in the true, educational sense of the term. They were designed to advise farmers on improved farming techniques which would be of help to them and also to assist them to implement a benevolent government's plans for the development of the country's economy. The personal wishes of individual farmers and their families were seldom, if ever considered. Agricultural extension service is an evolution of the advisory service which can be regarded as a form of community development with an agricultural bias and an educational approach to the problems of rural communities, as Savile observes.

It is also held in this study that the success of any extension work lies in a recognition and prioritization of the farmer's point of view as well as developing his confidence in himself and ability to initiate and manage agricultural change using mostly his material and manpower resources with a declining injection of government resources into such change. Savile says the primary objective is to change people's outlook towards their difficulties and develop the people themselves to permanently sustain change. They are taught to increase their knowledge, to make the best use of their faculties and skills and develop their capacity for work. People are taught how to raise their standard of living, by their own efforts, they are

aroused to recognize and take an interest in their own problems, to want to overcome these problems, to teach them how to do so so that they ultimately achieve a sense of satisfaction and civic pride in their achievement. The extension worker must hence train local leadership and encourage a spirit of self-help so that his influence can be more widely spread and the people can play their part more fully. This argument for a non-directive approach to extension actually underlies most community development thinking (Batten 1967, Biddle and Biddle 1965, Brokensha and Hodge 1969, etc.).

The nature of Kenya's extension services is however still by and large advisory and Uchendu and Anthony (op. cit.: 47) also say that they still "follow the conventional methods, essentially of a campaign nature" with the use of such techniques as demonstration plots mainly run by experimental stations, district farm shows, "teachouts" by the staff of F.T.C.'s, field days, general meetings, use of posters, 4 - k clubs among youths, contact farmers, etc. The farmers, following from the above approaches, are hence expected to see and copy or to hear and implement. Agricultural change efforts through such styles of 'extension' have therefore ended in a cul-de-sac in most places because this

'hand-out' method of technological advice delivery does not enable farmers to continue on their own once the extension officer is not around.

McLoughlin (1967 : 22-22) also subscribes to the views expressed above when he says that most of the implemented efforts have failed "because the farmer could not relate the effort to his own view on what was needed, his aspirations, his sense of economic viability, and his own farm's resources". He says what is important is "the examination and documentation of actual farm problems over a range of farm systems and, within a given system, over different types, sizes and capabilities of farms. These must in turn become the facts of life with which extension agents, and technological and economic research officers must work." He further observes that the extension officer should understand the present technology and farming systems as well as the problems of the small farmer because given the pressing need to raise per-acre and per-farm productivity, it is essential that farm systems be devised which are economically attractive to the farmer and which are not incompatible with his own resources (particularly labour and cash).



The question of the extension officer's need for acquaintance with the general problems of the farmers is also underscored by Savile (op. cit.:5) when he says that "Though increased production of cash crops may be an economic necessity, adult literacy, improved water supplies, medical facilities, co-operative credit, a road or a bridge, a school or a meeting place may be what the community feels it needs first." He says that "by helping people to overcome these wants first, the extension worker will gain their confidence and they may be more willing to tackle more problems which, though less obvious to them, are of greater importance to their well being." The officer must hence have sufficient knowledge of a wide range of subjects to enable him to advice and help people in solving their day-to-day problems. But the question which should be asked in this study is the extent to which agricultural extension workers in Kenya have such scope of training or the extent to which different extension workers in different fields work within a coordinated framework of operations with the understanding that their fields are intertwined given that they are also sharing the same audience whose cognition is not in any way so segmented.

Savile goes further to suggest a five - stage procedure for the operations of the extension officers thus: (a) a study or survey of the conditions in the community, (b) preparing the extension programme, (c) preparing the plan of work, (d) preparing the calendar of work and (e) evaluation and measurement of progress. This is a variability which actually does not deviate significantly from the thinking of the said community development scholars. But practicalities of rural extension in small-holding agriculture show that there is an absolute departure from this procedure so that the officers have remained ineffective.

It is also held in this study that the inability of the agricultural extension officers to effectively steer change in small scale agriculture could be due to the fact of their inadequate training which makes them ill-prepared to grapple with some of the very technical field tasks which otherwise should fall within their jurisdiction. Aldington (in Amann, op. cit.: 39) gives an example with cotton farming in Kenya where the Ministry of Agriculture (MOA) has often been blamed for poor standard of cotton extension service which was actually inherited from the Cotton Lint and Seed Marketing Board (CLSMB). Not only are the processes for disseminating information ineffective, but extension

agents themselves often lack correct information in cotton production. It should be observed in this study that field realities show that many extension officers in the rural areas are not any different from these cotton extension agents. It is the magnitude of the incidence of this problem that makes Gwyer (op. cit: 132-3) after Havelock Committee to rightly recommend that the MOA should "improve the diffusion of information concerning fertilizers to agricultural extension officers, their ability to interpret this information and their degree of contact with farmers." In fact their competence should be improved in handling all aspects of the farm technology package.

It is essentially against such a background of agricultural extension service in Kenya that one would be convinced to conclude with Gwyer (op. cit.: 131) that "while the potential for a Green Revolution exists in many areas of Kenya, the rate of adoption among small scale farmers of hybrid maize, fertilizers, plant fungicides and insecticides is proceeding at a pace which is more evolutionary than revolutionary". This conclusion will however be itself revisited in the discussion of the factor of agricultural credit towards the end of this chapter.

Agricultural Cooperatives:

Kuria (in Andreou, 1977:152) correctly underscores the role of agricultural cooperatives in Kenya by establishing and stressing that they also form the major co-operative activities due to the fact that agriculture is again the mainstay of the economy. Such co-operatives, he says, are engaged in collecting, processing, transporting and marketing the produce of the member farmer. They also perform other functions such as supply of agricultural inputs, ploughing and provision of seasonal credit. They have also diversified into commercial savings and credit functions. Kuria says that "Developing agriculture for increased agricultural production needs production inputs. The channels for supplying these inputs are not well established mainly because the traditional expenses of administering a multiplicity of small loans to small scale farmers -- and low productivity and the high risks involved tend to discourage the ordinary bank from entering the field. -- The increased production financed with these loans enables the farmers to save through their societies and this finance their longer term farm investments."

Yeh and Andreou (in Andreou, op. cit.:45) note that "Today with the very pressing problems of worldwide

food shortages, co-operation has become part of the 'package deal' by which governments are trying to lift their agriculture out of its subsistence husbandry and techniques into the required pattern of expanding output, rising incomes and more business - like attitude -- cooperation is part of the governments' administrative machinery for securing the fulfilment of national plans, and it must be judged in this context, -- Agricultural cooperatives must therefore command a central place into our agricultural systems in their drives to expand and develop the agricultural sector." This observation is acceptable in the light of Kenya's co-operative movement.

Although the cooperative movement is so neatly painted by the said scholars, it is not an end in itself, but a means to an end and in the process of achieving this ends, there are several disadvantages as well as advantages as presented by Campbell (op. cit: 12). But what is essentially crucial in Kenya is that given such functions, as outlined by Kuria above, the subsistence farmers, by virtue of their level and mode of production, income and standard of living, might opt not to join or form any cooperative as will be seen in sections to follow.

Marketing and Pricing:

The pricing and marketing of agricultural products are critical in any attempt to introduce and sustain change in the agricultural sector that ensures increased production. This is because both constitute major incentive systems that will influence the enthusiasm with which farmers will take on agricultural practice or accept the introduction of new crops or even new technology that entails increased production and therefore disposable surpluses through the market. But often price controls in terms of the management of floor and ceiling prices, for crucial crops as well as marketing are not effectively handled so that farmers, especially small scale farmers of maize and other basic staple crops, have had to grapple with stifling price fluctuations and the much uncontrolled local markets which are more useful to such farmers but whose operations are not far divorced from those of black markets. It is a common reality in rural areas that prices in such markets often plummet hitting rock-bottom and rocket sky-high at very wrong times for the small farmer due to the absence of effective price policies and controls relating to the very local markets for the very small farmer.

The level at which marketing and pricing controls

start to be meaningfully felt is not very relevant to the small farmer who is the object of this study. But even at this level, Hardiman and Midgley (op. cit. 108) still have a lot of scepticism. Basing their argument on Baker (1963) and Lipton (1977) they say that "Government marketing systems have been set up in many countries, but their benefit to the producer has been questioned.-- Even in cases where a government makes a genuine attempt to procure a fair deal for the producer, there is a tendency to set up systems in which overheads are so costly that the real value of the crop cannot support them. The result is that the margin between payments to farmers and the market price can be as high as 50 per cent." They contend also that pricing policies have also tended to act against the farm output. "Governments influenced by the power of the urban/industrial sector see cheap farm produce as one way of transferring resources from agricultural sector to other sectors in the economy." This thesis about the Siphoning of money through unfavourable pricing policies to the small farmer from the agricultural sector to the urban/industrial sector is perhaps best developed by Nyerere (in Shanin, 1971:375-76).

A number of reasons have been advanced in an attempt to explain the ineffective or absence of marketing and pricing controls. Uma Lele (in Andreou,

op. cit.: 49-83) gives one of the most incisive and comprehensive suggestions related to marketing and pricing strategies and considerations in rural development. Some of her observations are adaptable here. Apart from the laxity in tangible political will and sometimes inadequate competent personnel, Lele appropriately notes that poor pricing and marketing has been largely due to inadequate and imprecise relevant data related to these variables together with institutional weaknesses. She (op. cit.: 75) says that "Because a large part of the pricing and marketing problems arises from poor knowledge of the size and sources of food production and marketable surpluses, there is no easy substitute for improved data on yields and acreages under various crops by areas and by farm sizes as a way of estimating production and marketings." She also suggests that "expertise and institutional capability must also be developed within the government to collect and analyze information on (i) factors that should enter formulation of floor and ceiling prices, (ii) size of buffer stocks, and (iii) actual behaviour of prices and marketings by crops and by seasons. All these sets of data will, of course, have to be collected by geographical locations." (Op. cit.:76). These are noble, rational and practicable suggestions but which apparently are seldom adhered to meticulously.



But even if such measures were to be taken with the desired keenness, the lingering question remains: to what extent does the small scale maize or/and millet farmer who does not produce for the wider market (the small farmer who, if he ever has any surplus, sells either at home or in the nearest periodic market) become a subject or a beneficiary of such pricing and marketing measures? May be we need to prioritize other factors that can first thrust him into this arena of broad pricing and marketing controls before we can effectively talk about pricing and marketing, or our controls should be scaled down to grip even the very local outlets through which such small farmers dispose of their meagre surpluses - whichever is cost-effective to the small farmer.

### Storage Facilities:

Storage of agricultural produce has always been viewed from the points of view of the facilities that exist for holding the stock and also the propensity of farmers to use crop preservative chemicals or dusts. The ability of the farmers to store safely the excess produce until the time it is required or marketed without the danger of the same being destroyed by weevils and other pests as well as dampy conditions will have a decisive bearing on their willingness to

produce more crops on top of their immediate subsistence requirements. It will also have influence on marketing and pricing as farmers without proper storage capacities will hurry to the market and flood it with crops which they fear might get spoilt due to their inability to store.

Hardiman and Midgley (op. cit.:107) in fact consider storage as an important aspect of marketing and say after Hunter's (1969) finding that there are heavy losses in farm produce through lack of pest-proof methods of storage in India. They say "Because of the perishability of most produce and the fact that prices tend to be lowest at harvest times, the farmer who has no access to proper storage facilities suffers considerable loss of income." But this observation should be viewed within the context of the argument in the last paragraph in the section on marketing and pricing of agricultural produce. The question is therefore how relevant the storage problem becomes to the small scale farmers whose ability to produce any substantial surplus is so constrained.

It is always important to assess the exact extent of the storage problem and establish the magnitude to which crops get wasted due to this and also the extent to which the absence of such facilities or such wastage

offer an explanation to the low level of agricultural production. This is because many governments of L.D.C.'s where small scale subsistence agriculture still dominate have often missed the gun by tying unduely large amounts of capital to huge stores which have become white elephants because they operate at negligible capacities due to their over-estimation of the magnitude of the storage problem and the misguided contention that this will be an incentive to farmers to step up their agricultural production. Lele (op. cit.:77) warns that "--- there is a great deal of myth about excessively high storage losses at times leading to the conclusion that the food problem can be solved if only improved storage facilities were constructed. It is important to ascertain the precise nature and magnitude of losses by stages of marketing, crop, areas as fancy high cost storage construction may not always be justified by savings on losses."

The crux of the matter is that we can not save on the losses of the surpluses which have not been produced; the first concern should therefore be to design avenues through which such excess produce can be forthcoming to warrant the concern about storage facilities.

Transportation/Farm Access:

The factor of transport and its implications for agricultural production can best be summed up in the words of Hardiman and Midgley (op. cit. 107). They say that "many rural communities are cut off from the outside world by lack of adequate roads or transport facilities, particularly in the rainy seasons. Marketable produce has to be headloaded, often for many miles. This is not only time-consuming, it withdraws labour from the farm and acts as a discouragement to increased production." This has been established in a study done by Hardiman (1977) in Ghana. They say "in the early stages of agricultural development the physical fact of access is critical." After Haswell's (1967) finding in south India that there is a direct relationship between the price of grain to the producer and the distance from market, they conclude that "good roads are a necessary condition for (agricultural) growth". This concurs with Uchendu and Anthony (op. cit.:46) when they say that "investments in the road system, when they are accompanied by other opportunities in the agricultural sector have a major impact on agricultural development.

In view of the above, the question that was asked at the end of marketing and pricing section remains relevant here: To what degree does the small scale

subsistence farmer become amenable to this problem if he does not produce significant surplus, if any, for the market? can the mere improvement of access to the farm propel agricultural development as was found in Ghana or are there more critical factors that need priority attention and therefore, for the time being, makes the factor of transport peripheral? These questions will be answered by the end of the chapter when we shall have considered the factors that ultimately will determine whether such a small farmer can step up his agricultural production beyond the threshold of subsistence and into the market economy.

#### Farm Size and Land Fragmentation:

The gradual reduction of the sizes of farm holdings due to continued sub-division brought about by population pressure as well as the fact of plot fragmentation have been noted to act as crucial impediments to agricultural production. The maintenance of sizeable holdings together with the consolidation of fragmented plots have obvious advantages which work towards the improvement of agricultural yields. Ocharo (1977:61) and Mbithi (1974:98) agree that consolidation and big farm holdings will (a) accelerate the mechanization of farming by bringing a single individual's fragments of land together

into one continuous block,(b) reduce waste of labour in operating many scattered fields through the implementation of (a) above and (c) give farmers freehold titles to comparatively sizeable land to enable them to use the land as a collateral for obtaining loans from financing agencies.

But complication comes when consideration is given to the fact that in many parts of rural Kenya, either land registration has not been accompanied by consolidation (although noteworthy is also the fact that there are some places where the registration process has not been completed), or where the two processes have been carried out together, the situation has reverted to fragmentation due to buying and selling of land locally. In the study area, all the facets of the above complication are evident. But Mbithi observes in the same work that findings "in Kigezi, Uganda, for example, show that when one compares consolidated areas with non-consolidated areas of similar potential, no perceptible differences in agricultural development are observable." This shows that this factor of farm sizes does not operate alone but influences agricultural production as part of a package of other factors.

Climate and Soils:

These are the basic and most decisive factors that underlay agricultural production because all the other factors discussed in this chapter must, of necessity, operate within the framework of the two. The fertility and type of soils will obviously determine both the level of farm production and the types of crops grown. Gwyer (op. cit: 104) says climatic differences between districts determine whether one or two maize crops can be grown per year.

The most significant element of climate as far as agriculture is concerned is therefore rainfall and this exerts its influence on agricultural production in terms of its amounts, reliability and spatio-temporal distribution. Due to these attributes of rainfall, "agriculture is fraught with uncertainty, and the risk of crop failure is ever present." (Hardiman and Midgley, op. cit.: 106). Akungo (1977:58) also isolates inadequacy of rainfall and other physical constraints like soils as some of the problems impairing agricultural production. Inadequate, unreliable and unevenly distributed rainfall both in space and time accompanied by periodic and local droughts as well as consequent crop failures can make farmers more skeptical of the returns of hard work so that labour

is withdrawn from the farm and left idle as Ruigu (op. cit.: 326-7) observes. Uchendu and Anthony (op. cit.:30) also note that "a poor crop from last season's planting may compel a farmer to prolong his sowing time or spread his risks by planting before and after the rains." But it should be observed in this study that either way, the options mean loss in time, labour, and seeds so that agricultural production levels are eroded significantly. The two authors also say, and rightly so, that the temporal distribution of rainfall is more often than not so erroneous that short rains come too early before long rains' crops are harvested so that the two crops must be planted in separate fields to compromise the harvesting and sowing which so critically coincide. This therefore reduces the amount of land that can be put under crop in any particular season and therefore yields since one field can not be used for both seasons.

Another reality which the authors fail to note is that when the rains do not come early, they sometimes come too late when people have despaired and the time left too short for farmers to hurriedly prepare their fields and still catch up with the season. Farms hence lie fallow without any yields forthcoming. This has been a practical problem in the study area since 1981.



Policy Formulation:

The fact that agricultural performance in terms of production is pitted against so many problems means that policies related to the discussed factors must be rationally designed, thoroughly thought out, sharply focused and incisively articulated. Practicability and efficacy should be the prime and constant factors behind such formulation. Nyagah (in Amanna, op. cit.:1) is of the idea that "in the absence of a measure of enlightened agricultural policies, agricultural development is likely to be severely retarded if not confined to subsistence production only." He says this is because farming is riddled with so many problems that if there is no deliberate effort to encourage it, investors would opt out of it. Campbell (op. cit. 5) stresses that "Agriculture must remain in the forefront in the national policy making".

Many reasons are often offered to explain why agricultural policies, especially in L.D.C.'s, have in many cases failed to be efficacious. First, is the fact that many policies related to agricultural development are often formulated against the background of inadequate, unreliable and at times irrelevant field data so that they fail to really

address themselves to actual and existing problems. Anthonio (in Andreou, op. cit.: 249-51) and Campbell (op. cit.:11) agree that "timely, sufficient, reliable and usable" data is crucial in policy formulation, e.g. data on "value added", "what crops to be emphasized in the extension, research, credit, price and marketing programmes" (Campbell, op. cit.). He goes on to say that "unfortunately, the lack of data and analyses relating to value added leads to too many ad hoc recommendations by advisors. Data collection and analyses should be geared to two ends: for timely and well informed policy making on a macro-level and for timely and well informed policy making at the farm level." In many developing countries, and Kenya is one, macro-level policy prescription has relied on data aggregated from the farm through the field departmental officers. Such data has been collected using some of the most unscrupolous methods imaginable like arm-chair estimations on the basis of much uncontrolled field generalizations.

Second, agricultural policies have often failed to occasion any significant ripple effect among the small scale subsistence farmers who need the change most because their articulation has always never taken cognizanze of the world views and situational realities of the people Mbithi (1974) would call "the consensus centres " or "the prime movers of agricultural change" as they are called by Uchendu and Anthony - the

individual farmer or the family. Anthonio (op. cit.: 242-245) talks of the first, second, third and higher order decisions as they should relate to policy formulation. "First order decisions are those over which one individual has absolute authority. The effective scope of the decision may however have forward and backward linkages beyond the individual." It should be observed here that this level of decisions are increasingly becoming important as land privatization continues to take root in Kenya.

Second order decisions "are merely made by a defined small but homogenous group of people bound together temporarily or otherwise by a common and easily identifiable objective on relationship", like a family which in farming operations make such decisions with respect to some aspect of farm enterprises. Anthonio (op. cit) says that in unimproved agriculture "this order of decision - making is perhaps the most important." In the third order, decisions are outside the scope of the above individual or family but the farmer as an executive is still actively engaged in decision-making (e.g. in land ownership, price of resources and products, etc.) unlike in higher order decisions where the farmer is only remotely referred to, if any, What should be chipped in is whether the

Small farmer ever gets to the position of such an executive.

We cannot avoid pursuing Anthonio's views further on this issue because they are useful. He (op. cit.) suggests that in the rural areas of developing countries, policy decisions often ignore the small farmer's views while "in cases where the farmer's participation is expected before or after the policy is formulated and executed, his decision to participate can only be of benefit to him when such policies are fully understood and actively supported by him." He asserts after Schickle (1954) that "agricultural policy must be judged in the context of the cultural and social environment of which it is part (i.e.) --- agricultural policy is part and parcel of the social milieu". He says any effort to introduce policy or aggregates of higher order decisions aimed at improving any aspect of the human endeavours in any society should commence with improving the institutions through which decisions are aggregated and crystallised into formation of policy. This is because in the final analysis the decisions that are crucial are made by the farmers - the first and second order decisions. A poorly formulated farm policy has very little chances of achieving its objective even with the best of execution as found by Wilde (1967) in many low income countries.

We can sum up the above presentation by saying that in L.D.C.'s, including Kenya, there is often a big variance between stated policy prescriptions and what is actually effected. In this study, policy will remain the latter so that such a significant departure of the latter from the former does by no means augur well for our District Focus for Rural Development Strategy which, though is still in the making, is intended to nullify this weakness in policy formulation. This section should actually be appreciated in close conjunction with the section on policy review towards the end of this chapter.

#### Agricultural Labour:

The consideration of agricultural labour can be done on the basis of two broad questions: First, given that the agricultural sector is the biggest employer, how does or can the government organize its activities so that it absorbs maximum labour? Second, given that the country's food security and foreign exchange precariously relies on how efficiently we utilize the available agricultural resources, how does the government ensure that labour employable and employed in agriculture is absorbed and retained in this sector and does not seek employment elsewhere? This will of course also overspill to help the present rural-urban drift crisis.

These two questions entail three corollary questions: First, why is the agricultural sector currently incapable of stretching its employment capacity to even approximate its maximum potential? Second, What is "the prime mover of people" to other sectors out of agricultural activities? Third, who are the most mobile people who constitute the majority of people who migrate out of agriculture? As a result of these, one finally asks what the implications are for agriculture.

The first two broad questions concerning the organization of agricultural activities and the retention of labour within the sector have often been handled together through crop intensification via farm technology as well as the resultant maximization of land/labour ratio as was seen earlier in this chapter. Gwyer (op. cit.) becomes very useful in the articulation of these issues and will be used extensively in the answering of these two questions. He (op. cit.: 98) notes that programmes for small scale agricultural intensification "pre-date independence with the launching of the Swynnerton Plan, and have received added impetus since with the renewed emphasis on land registration and consolidation, the continued introduction

of new cash enterprises, etc.". Crop intensification, he notes, increase employment capacity of small scale agriculture because they lead to increasingly commercialized agriculture. This help employment by (a) enabling farmers to gradually withdraw from the labour force and employing others as they increase their yields and hence incomes, (b) the fact that cash crop require more labour than food crops, and (c) the fact that the purchase and application of material inputs by farmers raises both crop outputs and increases labour demand. It has, of course, been pointed out elsewhere in this chapter that hybrid maize with its attendant package (fertilizers, etc.) requires more labour inputs and through higher yields also enables small farmers to meet subsistence needs under reduced acreages thereby releasing more land for more labour - intensive cash crops.

It should however be noted as Gwyer (op. cit.:106) does that, still, among crops, subsistence or cash, labour requirements significantly differ in terms of whether they are crops with flat labour profiles or those with marked seasonal variations in labour needs - hence full time or casual labour. Family labour therefore becomes either enough or not and if enough in peaks it is underemployed in other periods. Hardiman and

midgley (op. cit.:104) notes that "the availability of labour at critical periods of the agricultural cycle acts as a major constraint on output; at other times, labour tends to be under-employed."

Gwyer (op. cit.:153) convincingly suggests that if our intention is to increase the income and employment generating capacities of small scale agriculture, we need to find ways in which districts and individual farms can be moved along the continuum from subsistence production to full commercialization. In the case of the very small subsistence farmer at the lower end of the scale this implies raising the productivity of food crops with farm technology so that land is released for the higher income, more labour-demanding cash crops as has been said. For districts still dominated with food crop production, this implies finding and introducing paying cash crops. But it should be observed in this study that a move towards full commercialization should be undertaken alongside an attempt to establish farmers' complete confidence in the functioning of the staple food markets. But if by making this move, the country's intention is to increase employment, ensure food security and to raise foreign exchange through cash crops, the move must be carefully designed and projected if the country is not to end at the crossroads which Gichohi (1974:48)



warns of. He talks of the danger posed by a government's over-emphasis of cash crops production for foreign exchange to buy industrial capital goods and repay foreign debt. This could be self-defeatist in its very nature because cash from such crops could be diverted to food which the government has to import again. Governments should therefore promote foodcrops to achieve food self-sufficiency first and it is only beyond this level of production that it should afford to divert extra attention to cash crops. Upto this point it should be said that using farm technologies to increase small scale farm employment capacity should however be viewed against the backdrop of the earlier mentioned Type One and Two technologies vis-a-vis the negative and positive substitution and employment effects and how these offset each other in different circumstances.

To be able to organize effectively and retain labour in agricultural sector, Gwyer (op. cit.: 139-41) says we need to be aware of spatial and seasonal distribution of labour inputs by farm enterprise in small scale agriculture. This knowledge enables effective farm planning aimed at increasing the farm income and employment capacities. Labour/land coefficients also show the workings of the labour

markets in small scale agriculture - "where crops attract hired labour, at what times, in what quantities and the characteristics of farms which do and do not hire labour." Gwyer warns of the conceptual and practical problems associated with these coefficients: actual work input (in terms of work intensity and time spent) and labour input measurements. But for the purpose of this study we must see the labour/land coefficients as being necessarily determined by the proportion of the farm under cultivation, the types of crops grown and the farming methods in general practice. We must work out which combination yields maximum employment chances, farm produce and rural incomes, depending on our area of emphasis.

But with the above prescriptions for the type of organization of farm activities, why is the agricultural sector unable to employ capacity labour? Most of the scholars cited above concur on the finding that the level of agricultural production and the mode of agricultural practice found in Kenya and most of the L.D.C.'s are still by and large such that subsistence scale of farm operations, underdeveloped farm technology and limited data about the prevailing labour characteristics still constitute formidable hurdles. These cripple the employment capacity of small scale

farms so that more than enough people crouch on such farms underemployed and with incomes, if any, that can hardly support acceptable livelihood. Whether this is true of the study area or not will be answered in Chapter Four.

Mcloughlin (op. cit.: 21) says that "Given the farms' size and restricted ability to produce under existing management systems and technology, most adult males have been frustrated in earning their living" and this has led to migrant labour. Sandberg (1973:233) therefore says "the prime mover of people" is the income differentials between rural and urban areas. He says the difference between the average rural income and average urban wage is always used as a measurement of the pulling force of urban centres upon rural areas. It is such small farm incomes brought about by a variety of factors and the resultant scepticism of farmers about "the returns to hard work" as Ruigu (op. cit.: 326-7) says that has led to what he refers to as the "Vihiga paradox" where good land is unused and small farmers sell their labour in Mbare where incomes are higher instead of expanding their acreages to increase their yields and employment from existing land resources.

Sandberg (op. cit.: 231) agree with Mbithi (1974-80) that the typical migrants are the young men between 20 and 40 years of age who are actually in their most productive years and tend to have more education. This is true in many rural areas although there are exceptional areas like Kisii (Uchendu and Anthony, op. cit.:44 and 66-68) where this has been broken by labour-intensive system of commercial agriculture. They found that 54% of Kisii farmers are young (between 30 and 49 years) and that the husband and the wife are the backbone of Kisii agriculture unlike in many areas where children, wives and the old are the ones left behind to till the land.

Such migration as presented, especially in terms of the size, structure (age and sex) and quality (education and training) have obvious adverse bearing on agricultural production particularly where incomes derived from the alternative engagements are not significantly different from the forgone agricultural incomes. Ruigu (op. cit.: 323) points out that at times opportunity costs of absenteeism from the farms far exceeds the gains offered outside especially in good potential areas like Vihiga.

Agricultural Finance and Input Prices:

Ker (in Amann, op. cit.: 313) and Gwyer (op. cit 126) rightly agree that lack of short term seasonal credit for the very small scale farmer to finance the purchase of farm material input constrains the use of such inputs and recommend that "properly secured loans" should be made accessible to farmers at low rates of interest. Two points become clear so far from the above: that the very small scale farmer, given his low income, can ill afford the required inputs for the improvement of his farm and that the available credit facilities are inaccessible to the same small farmer given the high interest rates and collateral requirements.

Gwyer (op. cit.: 133) points out that short term credit facilities for the small farmer have always been poor partly due to the high costs of administering small loans. This concurs with what Chege (op. cit.) also observed as had been noted earlier. He also says that such credit is confined to farmers willing to plant at least three acres of maize and this excludes many farmers. Perhaps Hardiman and Midgley (op. cit.: 106) sum up best these observations: "The institutional arrangements for giving credit are such that they favour the rich farmer who can provide collateral for a loan.

Even where government policies allegedly include the small farmer, the risk of borrowing may appear too great. Agriculture is fraught with uncertainty, and the risk of crop failure is ever present; the fear of even greater indebtedness acts as a constraint on innovation. Cooperatives are supposed to assist in this respect, but experience shows that they are of little help to the poorest." They quote Rao's (1985) findings in India to support these observations.

At this stage what can be said is what has been said before: that when all is said and done, the farmer needs finance to start his farm operations but given his stated low income, this finance is hard to come by from his personal coffers. Going out to sell his labour to raise such finance is detrimental to the farm as has been seen due to his labour which the farm crucially needs for agricultural production - unless the income obtained from such alternative occupations is to be and is actually ploughed back into agriculture to adequately offset the said opportunity cost of absenteeism. This means that the avenue left open for him are the credit facilities.

A review of the factors that affect agricultural production shows that the small farmer finds himself in a labyrinth of circumstances which can only best be

expressed in Gwyer's (op, cit.,; 133) words: "small farmers often appear caught in a low level equilibrium where their own labour is insufficient to meet labour peaks if all their land is cultivated. Until they make full use of their land they will not have a sufficient cash to purchase new inputs that bring with them technological advance and higher income. Lack of cash, or the inability to carry it forward from harvest to the next cultivation season, precludes the hiring of labour. In order to break this circle, farmers may seek off-farm employment in slack times for the cash to hire labour to develop their farms, but this cash may not be saved until the time that it is most needed. In the absence of the non-farm work opportunities for many farmers and in the view of the management problems that absence from the farm can bring, there is at least a prima facie case in some districts for loans to enable farmers to hire labour, in addition to credit facilities for the purchase of material inputs."

Two of the most fundamental and acceptable points to note in the above observation are, first, that there is the dire need for agricultural finance as the most critical factor that can thrust the small farmer out of the mesh where he is entangled, and second, the view that universal prescriptions for agricultural improvement

is not workable at times so that sometimes there is need for differential treatment (especially with regard to credit terms) depending on which farmers and which districts are worst hit. This will definitely call for state intervention by way of selective and redistributive policies revolving around the principles of regional balance and equity considerations. This is obviously radical and might trigger off a lot of political waves and backlash but the government has an obligation to defend and improve the welfare of small farmers and must therefore take a firm stand if its genuine intention is to achieve overall agricultural advancement.

Given, however, the fact that about 70% of Kenyan farmers are small scale and that the majority of them are still in one way or the other caught up in the said mesh, a decision to take the suggested radical path must be evaluated against the backcloth of its financial implications if it involves so many farmers. The question is whether it is a practicable suggestion for Kenya given the country's financial resource ability. Because it is common knowledge that Kenya has by and large depended on foreign loans and donations to uplift its agricultural sector, this suggestion would not be very financially comfortable for Kenya if it had to depend on its local means. And yet dependence on foreign



loans and donations is as unreliable as it is unsafe, especially in the long run when the country is considering becoming self-reliant and breaking away from such kind of financing. What therefore remains clear is that we must come up with solutions and design measures that can use other local resources to mobilize finances that can be injected into the agricultural sector to pull the small farmers out of their subsistence enterprise. The country can therefore take the radial path through foreign financing but this should be in the short run during which time the local sources are developed to take over when the former becomes undependable. These arguments will become more clear in the last section of the last chapter.

#### FISHING ACTIVITIES:

Many studies have been carried out that have treated fishing as either a total subject of study or a topic given substantial consideration. Such studies have come up with various interesting findings about fishing some of which are relevant to this study and are therefore worth mentioning here. It should however be noted here that the central subject in this study is agricultural production and it should be clear by now that fishing activities only come in as a factor that is postulated

to influence agricultural production. This study will therefore not delve into the fishing activities by way of any detailed assessment of factors and issues that surround in fishing industry. Fishing activities will be looked at as a factor itself that influences farm production like the rest of the factors already discussed. But it is only useful to briefly look at some critical factors related to the fishing activities because this helps to throw some light on the circumstances surrounding the drifting of rural labour from agriculture to the fishing activities. Otherwise the two basic variables related to fishing activities that are relevant to this study are the labour in this sector and the incomes thereof because it has been pointed out that it is through these that farm production is affected. Most of the variables considered here will be just proxy.

Akungo (op. cit.: 58) established (as is already said in Chapter One) that 29% of the people in Mbita Division of South Nyanza engage in both fishing and agriculture. Keruhanga (1979:18) found that 80% of the people in his study area engaged in fishing and other occupations of which agriculture was the most dominant. Mc.Henry Jr's findings was that there were between 2300 and 6000 fishermen in the Kogoma region of Lake Tanganyika. Jiwani (1972) also established that as early as 1969 there

were 40,000 to 60,000 fishermen with about 120,000 dependants on the whole of Lake Victoria who derive a large part of their livelihood from the industry. Of these 17,600 were on the Kenyan side of the lake. These findings are significant in that they show how much of the labour force fishing activities can draw from the hinterlands. Fishing, therefore, being a sector that offers employment opportunities definitely is an income source. Jiwani and Babikanisa (in Amann, op. cit.: 254) also found that the Kenyan fishermen on Lake Victoria produced fish worth Kshs. 15.5 million in 1970. More upto date figures as presented in the current National Development Plan (1984-88) are that the total fish landed in 1963 was about 19,700 tons valued at Kf 1.1 million. This increased to 80,000 tons in 1982 valued at Kf 11 million. Target levels of fish production for 1988 was to be 120,000 tons of which Lake Victoria was to account for 50,000 tons.

Akungo also found that 25.6% of the "farmer-fishermen's" incomes are from fishing. Jiwani notes that a canoe of five fishermen brings an income ranging from Ksh. 180 to Ksh. 500 per person per month (gross before depreciation costs). Despite the fact of very low incomes from fishing, which Jiwani also notes, what these figures show is that fishing as an activity is an income

earner that supplements agricultural earnings in rural areas where water masses are found.

The core-role played by the two activities with regard to subsistence, income and employment provision is established and underscored by the same scholars cited above. Jul-Larsen (1981:42) also established a close mutual link between fishing on Lake Turkana and Pastoralism (which is the Turkana's equivalent for Lake Victoria's agriculture) which offers a very nice analogy to the two activities in question here.

SYNTHESIS:

From the above sections, the general trend of thinking and findings with regard to fishing activities and factors affecting agricultural production are now apparent. The fact that these studies done in different areas and at different times find unity in the type of factors that they hold to explain low farm production and the complementarity of the two activities imply only the general nature of the factors - the fact that these are factors which have been tested and found to variously apply to broad rural and agricultural areas. They are therefore assumed here to be very easily capable of excluding crucial factors specific to localities or regions where other environmental/ecological conditions

might be so peculiar that explanation by the too universal factors may not be totally useful in understanding farm production level.

On the basis of the above, this study therefore subscribes to Hardiman's and Midgley's (op. cit.: 89) view that "much is known at the macro-level about the dimensions of the problem (of rural development). This knowledge is important in estimating the scale of action needed. But in order for action to be effective, there is need for a deeper understanding of rural communities at the micro-level. The variety of rural situations is so great both in ecological and social terms, making it doubtful whether general prescriptions for action can be valid." This implies that instead of continuing to assess the low agricultural production in the study area in terms of the generally recognized factors, there is need to move closer to the ecological peculiarities of the focal area and attempt to diagnose the problem on the basis of the micro-realities prevalent there and not to just go by the broad factors that are applicable at the macro-scale.

The hinterland of Lake Victoria where the study area of this work lies has the Lake as a unique and specific factor. Low agricultural production in this region might

therefore be explained by the postulated factors only in so far as the focal region is generally and broadly rural and agricultural. But it is significant to ask the extent to which the lake as an added factor also helps to explain the level of agricultural production in this area; or even the extent to which this added factor can tamper with the effective application of the other factors in an endeavour to improve production. These are however questions that have not been addressed by the above scholars and others who have carried out their studies within the lake's immediate hinterland. This study recognizes this areas specific attachment to the Lake and the specific activities associated with it and the possibility of these adding a fresh dimension to our appreciation of the level of farm production here.

Just as the studies on agricultural production, those on fishing as an economic activity undertaken by various rural agricultural communities that live close to different water masses, have treated the subject and sector of fishing as an exclusive one that, apart from the significant contribution (in terms of income, diet and employment) it makes to the participant communities, does not have any impact on other activities like agricultural engagements.

Taking pastoralism within the Lake Turkana's context as an analogue of agriculture in the study area, Jul-Larsen's (op. cit.: 35) lengthy observation which this study also buys for this synthesis becomes quite adaptable here. He says " As the traditional economic system was exclusively based upon pastoralism and new economic activities have mainly been introduced from outside, there has been a strong tendency among planners to treat the different economic sectors separately. The different sectors have been looked upon as bases for independent economic systems, where people could go from one sector to another. Within this framework, crucial questions necessarily become: How do people change from one sector to another? What restrictions exist upon such changes and for how long will people remain in the new sectors before they return to pastoralism? (How do the households keep one foot on one activity and another one on the other and still manage to make both themselves and the footholds stable?) --- relations between people in different activities are still strong and lasting, so that producers can without too many problems switch from one activity to the other. Fishing and pastoralism are tied together in such a way that one should look upon them as bases for one common economic system and I think this also is true in connection with other economic sectors."

Following from the above view, even though the above cited studies present such useful information on agriculture and fishing, they remain sectoral works that are exclusively devoted to each of either activities without venturing to compute the extent of the influence one activity could have on the other, especially as concerns the labour and income factors. This is in spite of the fact that these activities are undertaken in the same localities and by the same people so that possibilities of conflict could be posed. Karuhanga (op. cit.) found that the ages of boat owners range from 23 to 51 years while the ages of fishermen (he makes this distinction) range from 15 to 36 years. He also found that the "peasant - fishermen" devote only two days a week to agriculture. From this he goes on to articulate the argument about the connection between fishing and agricultural activities without using some of his figures to really compute the extent to which such labour diverted to fishing actually influence agricultural production. In the same way the income figures with regard to fishing activities are not investigated further in connection with how such incomes are invested and hence the possibility of re-investment in agriculture to raise productivity. This study identifies these gaps in the previous studies and attempts to provide some light along the same lines.



It can therefore be seen that fishing activities can in fact also be treated alongside the rest of the factors discussed earlier as a crucial determinant of agricultural production in the study area. This perspective has already been made mention of earlier. But fishing activities as such a factor makes us re-visit the last two factors (farm labour and agricultural finance) but only in a different dimension. Mention had also been made already of how migration of labour from agriculture is crucial to farm improvement and also how finance underlies any agricultural development endeavour. The argument being advanced here now is that fishing activities divert the same labour from agriculture and incomes from fishing activities which could constitute critical agricultural resource might not find their way back to farm investment. Farm labour and finance as integral factors influencing agricultural production are revisited here but now as test factors (intervening or control variables) through which fishing activities are postulated to influence agricultural production. It is this postulated relationship that elementally constitutes the gist of this study. Before we move to define how this relationship is going to be tested and the actual testing, it is necessary to present a brief overview of the government policies with regard to the two activities to see if there is any attempt to

coordinate the two given the advanced influences between them.

POLICY REVIEW:

The policies that are presented here are based on 1979 to 1983 and 1984 to 1988 National Development plans as well as the Sessional Paper Number One of 1986 on Economic Management for Renewed Growth as they treat the two activities. The two development plans should give a fair impression of policy changes, if any, in recent years and the sessional paper presents a satisfactory reflection on past policies and gives reliable and useful direction of future policies in the plans to follow. It says in the preamble that "1986 presents a ripe opportunity to look much further ahead, towards the end of the century, to determine what kind of an economy Kenya is going to have and how it is going to get there."

POLICIES ON AGRICULTURAL PRODUCTION:

It is stated in the fifth (1984 to 1988:177) that the objectives regarding agricultural improvement remain the same as they were in the fourth plan. The sessional paper also remains very concordant to these two plans

which actually suggests that Kenya's agricultural production policies have been steady and consistent through time and what have actually changed over the period are the targets which have by and large been influenced by changed circumstances within either the agricultural sector or the other related sectors in the total economy.

The chief objectives in agriculture broadly have been to achieve increased food production to ensure food security or broad self-sufficiency in basic foodstuffs, growth of agricultural employment, expansion of agricultural exports, resource conservation, growing farm incomes and stimulated productive off-farm activities in rural areas.

Agricultural production therefore consistently becomes one of the central concerns of the government for whose achievement a number of policies and programmes have been devised:

- (i) Focus on small farm
- (ii) More intensive resource use through improved crop husbandry practices.
- (iii) Technology improvement through increased research and extension effort.
- (iv) Market incentives that not only provide fair prices

but also ensure prompt payment for deliveries of produce to parastatal bodies.

- (v) Increased access to land and land-based employment
- (vi) Diversification of production patterns in favour of crops like tea, coffee, vegetables for higher incomes and more employment per hectare.
- (vii) Credit provision
- (viii) Development of the cooperative movement.

A keen examination of the way the above policies are articulated and programmes defined in the documents show clearly why one is driven to find acceptable Gwyer's (op. cit.:131) observation that in Kenya, the small scale farmer's match towards a potential Green Revolution is more evolutionary than revolutionary - in fact it should be noted here that for such a farmer a revolution of this nature remains remotely illusive. Crop and farm intensification and the adoption of the technological package by the small farmer relies on agricultural extension and credit. Agricultural extension, whether through the contact farmer or Training and Visit (T and V) approach, has remained advisory and, as was observed within the context of Savile's (op. cit.:1-9) view, has continued to be trapped by the pit-falls of such a

hand-out orientation of service delivery. Credit facilities have continued to be equally illusive to the very small farmer who needs it most but who, due to the requirements of its acquisition, is unable to have access to it.

A real organized private market as a mechanism of setting prices still continues to exclude the small scale farmer who still sticks to growing traditional subsistence crops in small scale due to his inability to be reached by effective extension services and meaningful credit facilities. The small local periodic markets, if he does not sell at home, which are more relevant to the small farmer when he happens to have a small surplus is without adequate and effective price control systems, a fact which moves them closer to the black market operations characterized by abnormal and unfavourable price fluctuations. Such a small farmer who remains so 'small' at every turning of improved farm operations does not even find membership to cooperatives very useful until he grows a little 'big' to reach the technological package utilization and commercial market where effective controls are administered. But the paradox is that cooperative membership is one of the means of nourishing such a growth. The begging question is:

how does the small farmer then resolve this paradox? One of the best answers might only lie in the radical selective state intervention in the farmer's favour as had been previously suggested.

The above state of affairs hints at a possible loophole in policy formulation which could, in all probability be attributed either to inadequate and/or unreliable data that is fed into the design of policy so that they do not precisely reflect existing and practical situations; or disregard of the small farmers' contribution to policy evolution so that resultant policies have often remained mere government enthusiasm as to the direction and pace agricultural development should take. If the above are true, then the government should accordingly reorientate and revise its policy formulation procedure always keeping in mind that mere 'policy' enthusiasm without correct data basis does not automatically lead to immediate and dramatic rapture among small farmers. Such enthusiasm cannot be any substitute for meaningful policy commitment in the right direction - commitment given material and practical back-up.

## POLICIES ON FISHING ACTIVITIES:

Fishing as an economic activity has often been either ignored all together or given a very small treatment in policy documents - something that is in fact no better than a fleeting caption of facts and a few brief policy statements relating to the industry as reflected below. It is totally ignored in the important sessional paper (op. cit.).

Lake Victoria is going to be exemplified here. It is indicated in the latest two plans that policy programmes were to be directed towards the introduction of diesel engined and geared trawl boats to exploit the largely untapped off-shore fisheries resources; training of additional professional field staff, fishermen, boat builders and repairers, specialized extension services to fishermen to strengthen fishing and fish handling capabilities of small scale fishermen and improvement of transport facilities as steps to increase production of inland waters (and in this case Lake Victoria). Not so much is said about fishing policy, especially fresh water fishing, so that the fishing policy area still remains grey and ignored. One cannot therefore afford to discuss it with any authority.

SYNTHESIS:

A look at the nature of the above policies does not present any relationship between the two activities so that one is led to believe that policies are still conceived and formulated within the framework of the dichotomy of the otherwise complementary and interwoven sectors as Jul-Larsen Observed. The position in this study is however that there is an obvious nexus between the two sectors as is already articulated and planners must also tailor specific policies expressly addressed to this connection which is defined by labour and income variables. It is only through such orientation in policy that planners can achieve mutual relationship or linkage between fishing and agriculture represented by optimal operations of the two activities: this should, in earnest, be one of the most basic and ultimate goals of development in this region.

Given the Hardiman's and Midgley's (op. cit.: 89) "variety of rural situations" in ecological or climatic terms, blanket agricultural policies cannot augur well for increased production if in addition to the general policies formulated planners cannot evolve a separate breed of region - specific policies based on such variations. Only such policies can adequately address



themselves to the very localized factors that can add 'extraneous' dimensions to our explanation of levels of agricultural production. Our national plans should hence have a section devoted to policies attuned to specific regions like the Lake Regions, the Highland Regions, et.c. on top of the overall policies.

## CHAPTER THREE

### METHODOLOGY

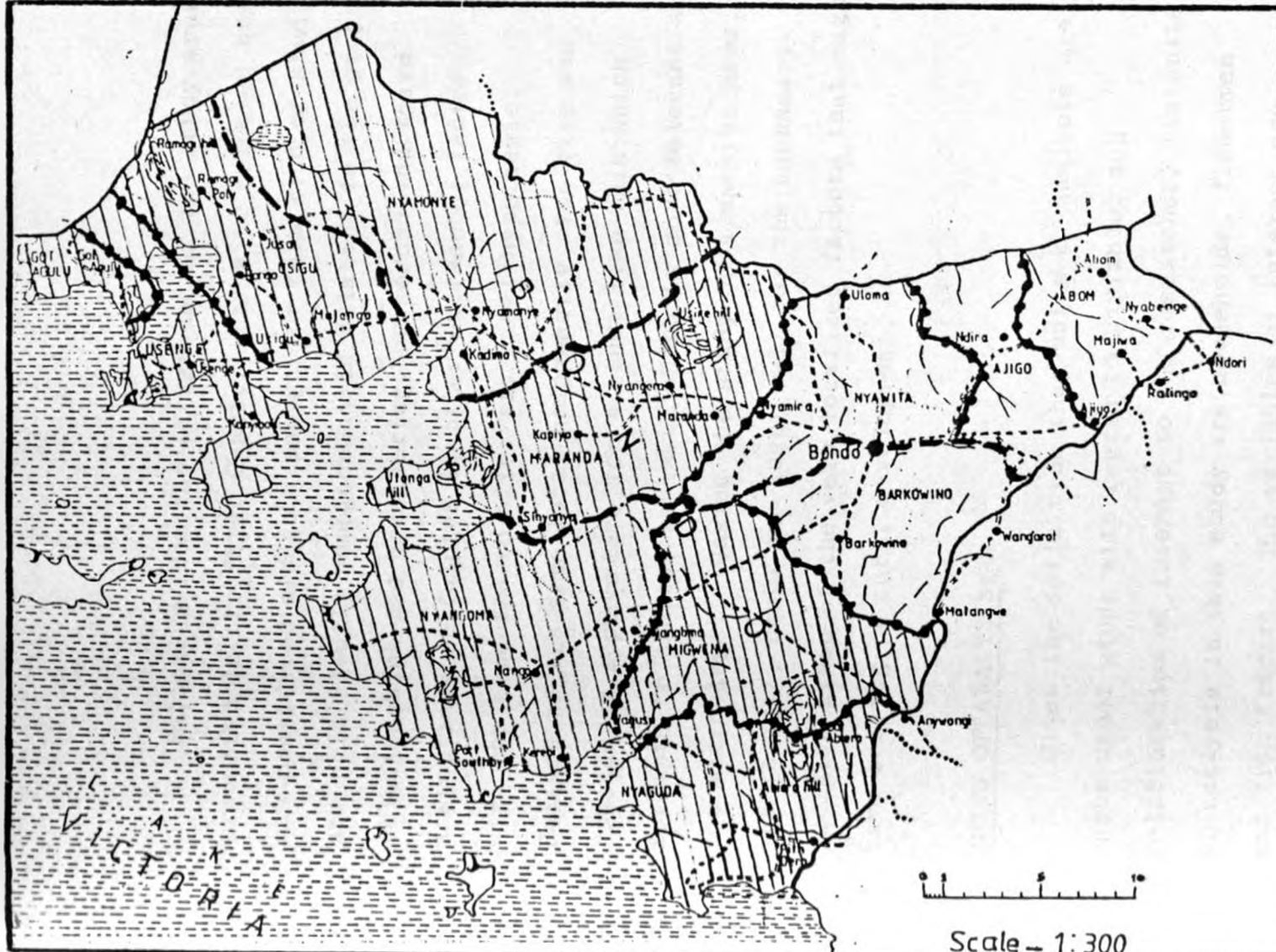
#### SITE SELECTION:

The selection and definition of a study site should always be done against the background of the nature of the research problem and also the focal variables as well as relationships that the study seeks to test. The site should therefore remain homogeneous in relation to such a background so that internal variations within a site do not introduce unnecessary extraneous factors which might colour the hypothesized relationships by offering rival variables. This should always be ensured unless the focus of the study are these variations themselves so that the research problem and the postulated variable relationships are articulations of such variations.

Omare, in his discussion of the effects of population pressure upon agriculture, rightly chose Kisii District where population congestion is a real issue (op. cit. 1981). Kinyanjui (1976) justifies his choice of Kikuyu division as his study area because the subject of his inquiry is the impact of a new road on land use and at the time of his study a new road has just been constructed which he finds out has totally re-orientated land use pattern. Many more scholars justify their choice of the study areas









in the same fashion, e.g. McHenry Jr. Op.cit., Ocharo 1977, etc.). Because sites selected on the basis of research problems as the above are generally homogeneous in relation to such problems, site selection therefore becomes a control by itself which ensures that generalizations made on the basis of the findings from a given study site for other sites elsewhere with similar conditions remain valid and plausible.

It is against the above background that the defined study site (Map 4) was selected in Bondo Division. It is an area which records very low agricultural production and where a variety of measures have been instituted without much success in raising such production. It is also an area which fronts the lack and which therefore loses a lot of people to fishing activities with the likelihood that agriculture is ignored. Following from the stated research problem and the hypothesised relationships, Bondo therefore presents a fine area for a study of this nature. The above is also strengthened by the fact that the researcher has better personal experience with the agricultural development circumstances in Bondo than in any other area with similar conditions.

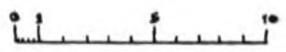


# THE STUDY AREA (BONDO DIVISION)

## LEGEND:

-  DIVISIONAL BOUNDARY
-  LOCAL BOUNDARY
-  SUB-LOCAL BOUNDARY
-  Bondo DIVISIONAL HEADQUARTER
-  Ajiro LOCAL CENTRE
-  ROADS
-  RIVERS
-  SAMPLED AREA

**SAMPLED  
AREA**



Scale - 1:300

Following from the background of the study area presented in the first Chapter, the site selected here was considered sizeable enough for this kind of study and sufficiently homogeneous in relation to the proposed relationships and considering the second and third assumptions in Chapter 1, other extraneous factors were not expected to offer any rival hypothesis. Because of the same local homogeneity, the site was considered appropriate for a study like this which attempts to address an issue which is more relevant at the micro-level. Basing the study on a massive area, was thought, could not augur well for the necessary incisive grasp of the very localized factors that might have bearing on rural development.

#### UNITS OF ANALYSIS:

Given the definition that units of analysis are cases under study with regard to variables and relationships of interest to the researcher, the units of analysis in this study are households, fishermen and fish traders. The variables of interest are basically agricultural production and fishing activities. There are however a number of proxy variables relating to these core variables which will actually be used in testing the relationships. These will be seen explicitly in the relevant sections.

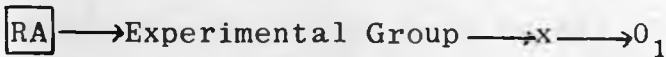
The fact that agricultural production is the basic dependent variable, the household therefore becomes the basic unit of analysis. This is because it is the household that bears the brunt of the impact of the absence of those in fishing activities like fishermen and fish traders. It is also because the latter are also treated as they relate to the household unit in terms of the money they remit from their occupations, the time they devote to their household farms to boost agricultural production, the rest of their household members who actually work on the household farm, etc.

The studies already cited above have either taken the individual farmer/fisherman or their households as the units of analysis. But what should be noted is that in most cases even where such individuals are taken as the units of analysis, their households are of ultimate interest. This is why a researcher like Jiwani (op.cit.), although talks of "farmer-fisherman", ultimately stresses the 120,000 dependant members of their households. Akungo (op.cit.) also refers to the farmers who also engage in fishing activities but would like to look at the incomes they derive from these sources in terms of household incomes.

STUDY DESIGN:

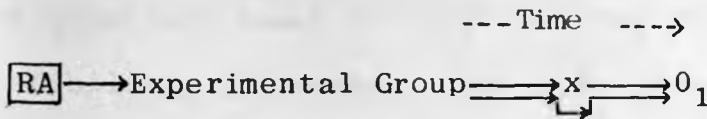
The design that is used in this study is posttest only design. All respondents (household heads, fishermen and fish traders) are randomly assigned (RA) from single populations or sampling frames of study site residents and fishermen and traders at selected fish landing points to the experimental groups. In the case of fishermen and fish traders, the types of work they do (x) have intervened in their occupational experience before the research is undertaken. After engaging in these fishing-related activities for some time (i.e. after the intervention by such activities), a measurement survey ( $O_1$ ) is done.

---Time-->



The above is the schematic representation of the posttest only design adopted for studying the fishermen and fish traders. But since there is no control group as is always found in pretest-posttest designs, there is no possibility for comparing the  $O_1$  measurement with any other measurement (i.e. there is no pretest component).

It should however be noted that with regard to the households there is a slight variation to the design presented above. This is because there were those households with members who were in fishing and which therefore answered to the above framework where occupational intervention (x) becomes relevant. These were also those without members in fishing activities and for which (x) was irrelevant. We can therefore introduce a channel that circumvents (x) and subjects this portion of the experimental group directly to measurement survey (O<sub>1</sub>):



Following from the discussion of such study designs by Fisher, et al., it will be seen that the above study design is not weak by any standard because in the choice and designation of the units of analysis as well as in the design of the research instrument care was taken (by the division of the respondents into the three categories explained in the opening of the next chapter and by introducing probing as well as consistency and data quality check questions) to provide for inbuilt elements of pretest-posttest design which is normally superior in control for extraneous variables. Pretest-posttest design could however not be used in



this study due to the short period of time and other resources (financial, personnel, etc.) available to the researcher.

The division of the sampled households into those without and those with members in fishing caters reasonably for the control and experimental groups respectively which is the basic strength of the pretest-posttest design. The fact that there was also a separate sample of fishermen and fish traders also means that it was made possible to ask some control type of questions meant for ascertaining data consistency and credibility. Otherwise the only threats to validity which could have been applicable to this study are history, maturation, mortality and test factor but these are nullified by the very short period of time the research took.

#### SAMPLING:

The sublocations that border the lake (as shown in map 4 in the first section of this chapter) constituted the sampling area or study site. In terms of spatial coverage, the area is 75.43% of Bondo Division containing 66.98% of its population and 68.67% of its households. Apart from its proximity and direct frontage to the lake as well as its low

agricultural production, the area is also satisfactorily representative in terms of the proportion of the population, households and area it has.

On the basis of the 1979 population census which put the number of households in the study site at 7,383, a projection for 1987 (when the study was actually carried out) was done which estimated the figure to have shot to 10,855. The study took an initial sample of 150 households which was 1.38% of the population. This sample size was considered representative taking account of the homogeneity of the population and the already mentioned time, finance and personnel limitations that the researcher was pitted against as well as technicalities related to field logistics which also constituted constraining factors especially as they relate again to the said limitations. The sample cases were assigned choosing a proportionate number of respondents from each sub-location depending on the proportion of the households each had, thus:

Table 1: SAMPLE PROPORTIONS

SUB-LOCATION	HOUSEHOLDS IN % OF TOTAL	TOTAL NUMBER OF HOUSEHOLDS	NUMBER OF QUESTIONNAIRES
1. Migwena	15	1106	23
2. Nyaguda	13	940	19
3. Nyang'oma	19	1366	28
4. Maranda	11	838	17
5. Nyamonye	22	1659	33
6. Usigu	9	645	13
7. Usenge	8	594	12
8. Got Agulu	3	235	5
Total	100	7383	150

Source : 1979 Kenya Population Census Report.

None of the studies cited above apart from Uchendu and Anthony (op.cit.) have gone by the above strict assignment of sample cases proportionately within sub-units of their study sites to ensure fair and representative spread.

In the actual administration of the research instrument within the above sublocations, area sampling method was used in deciding the actual households to be interviewed. The area sampling method was adapted after attempts had failed to obtain any complete record or list of local residents from any where, not even from

the District Land Registry. Variations of this sampling method have been used in many studies elsewhere as indicated by Kayongo Male in her paper "Adaptive Sampling in East Africa". She offers this sampling method as a radical break from the prescriptive sampling methods coined in the advanced West where such detailed records are readily available even for local rural settings. She contends that in similar settings in less developed countries, alternative compromise must be sought if researchers are to grapple with the inadequate research conditions existent. In area sampling, we therefore can use available units like ridges or even transects defined by roads, prominent physical features, etc. to delimit ourselves further to decide and reach the final respondent.

Within each sublocation, therefore, the researcher chose various points which, judging from a detailed map of the area, were fairly spread to capture representative information from the sublocation. The questionnaires for each sublocation were divided equally between these points from where interviewing started. The number of points per sublocation were such that each point had not more than four questionnaires each to be administered in the first home north, south, east and west of the point. Failure to get a respondent in the first home qualified the second home and so on.

At the end of the questionnaire administration exercise, 139 questionnaires were actually administered which constituted 1.29% of the sampling frame. This was so in view of the stated limitations and constraints. In the process of data analysis, however, 14 questionnaire schedules were discounted on grounds of gross inconsistency, non-response and therefore suspicion of cheating by one of the assisting personnel. This finally left 125 questionnaires (1.15%) which actually forms the primary data base in this study as far as households sample was concerned. The difference between the anticipated number of questionnaires and the ones which have actually been analysed compromises the sample size originally designed, but this will be expounded on in the relevant section.

Within the context of the already mentioned limitations related to time, finance, personnel and field logistics, it was only possible to take a sample of 80 fishermen and fish traders from the licensed 6500 people in the two activities in 1987. Of the fish traders, 34 were interviewed together with 46 fishermen to make up the 80 respondents (1.23%) who were selected at the two randomly chosen fish landing beaches (Wagusu in South Sakwa and Usenge in Yimbo). The assignment of the sample cases into the sample was done randomly from a list supplied by the fisheries

stations at these beaches. Where those selected refused to be interviewed or could not be located due to their irregular and migratory fishing and trading habits, replacements were made from the same lists in the same manner explained.

#### DATA COLLECTION METHODS:

This study, like the rest of the studies cited in Chapter Two, has first relied on secondary sources of data which were basically the available literature related to both the problem of this research as well as the variables that were isolated as relevant to the study. This was principally content analysis of material obtained from both the library and other sources like district departmental offices. These were reviewed to provide the necessary conceptual framework within which the research problems and variables could be understood further and researched on. These are better presented in the previous chapter dealing with literature and policy review.

The second major category of sources of data used in this study is primary sources. The first such source were interviews of and discussions with informants who were relevant government officers like District Agricultural officer, Fisheries officer,

Lands Registrar, Survey officer, Agricultural Finance Corporation Siaya Branch Manager, Provincial Hydro-Met Officer, Geologist, etc. This source was used so that the researcher could broaden his conception of the research problem and focal variables and also to get some control information against which data obtained from other sources could be gauged.

The second primary source of information were the interviews of samples of respondents conducted using two types of structured questionnaire schedules. The questions were structured in such a manner that there were probing questions intended for in-depth interviewing as well as the control questions for checking consistency and reliability of some data given.

Field observation by the interviewers was also found useful to either fill in information or counter-check some information given by respondents. For example, in the estimation of the sizes of the farm holdings, if the interviewer was on or near the same land parcel in question he could help in the estimation, especially where a respondent was not sure of the precise acreage. This was also applicable to questions related to distances since the interviewers were chosen to work in their own sublocations.

## TYPES OF DATA COLLECTED

In the definition of the scope of this study in Chapter 1, precise mention was made of the types of variables which are crucial to this study and for which data was collected. These are again presented in the discussion of data analysis techniques towards the end of this chapter.

Without getting into unnecessary repetition it can be briefly said here that the data collected in the field can be broadly categorized into two sets. There is the data that principally relates to the variables that define the hypothesized relationships on one hand and there is the data that captured information on the general factors which have previously been postulated by other scholars to explain low farm production. The first set has to do with such variables as farm production and earnings, the labour in fishing activities and their income, proportion of income from fishing activities invested in agriculture, proportion of farm holdings under cultivation and time spent on farm work by those in fishing. Following from the arguments in Chapter 2, data on variables such as above is used to test the advanced hypotheses.



The second set of data relates to factors like farm technology, agricultural extension services, agricultural cooperatives and so on as argued by the previous scholars to influence agricultural production. These are used in analysis to test whether such factors have any relevance to the study area as specified in objective (v) in Chapter 1. It is however significant to point out that data was also sought in relation to factors that explain the level and mode of operation in fishing activities. As was pointed out in Chapter 2, such data is not meant for any in-depth and exclusive assessment of the fishing industry. The data is only used in so far as it helps to establish the background against which the current levels of incomes from such activities can be appreciated as well as the basis for assessing the potential for further growth and development of this sector if it is to support agriculture as argued in this study.

It is useful to say that the first set of data mentioned above is by and large quantitative and become quite crucial in the achievement of the required precision in the computation of the impact of fishing activities on agricultural production. The second set of data is both quantitative and qualitative because apart from tapping information that is given in exact

figures like the amount of credit acquired, information is also sought on such variables like awareness, opinions and so on. Whether qualitative or otherwise, the data however become useful in testing the hypotheses and the bearing the other factors have on the study area's farm production. Chapter 4 will present in more detail the use to which the data is put to achieve both the purposes.

#### PROBLEMS IN DATA COLLECTION

Given the defined study site, sample size and the method of acquiring data, the first problem that was experienced related to the already said short period of time the research was meant to take, the limited finances at the researcher's disposal and therefore also the ability to hire, train and deploy adequate research assistants in the field. These problems which the researcher was up against had definite bearing on the sample size and breadth of coverage of supplementary information which was required.

The fact that the core variables in this study needed by and large quantitative data also presented a problem in terms of respondents' general inability to remember such figures off-head. The data given for

variables like crop yields, cash earned from particular crops, incomes from fishing, fish catch in weight and cost etc. must therefore be appreciated within the framework of this problem and the fact that a lot of probing had to be done to extract such information from respondents.

Tied to the above problem of respondents' genuine inability to give some information due to lack of knowledge or memory, there was also the problem of people's reluctance or unwillingness to divulge certain information, e.g. those related to income and expenditure, credit acquired, number of household members, etc. This was due to a number of reasons like people's fear to disclose their wealth because of a feeling of insecurity; their traditional interpretation of counting members of one's household, especially children and so on. Such questions equally required a lot of probing.

The fact of unkept records and general unwillingness to reveal certain information are not however unique to this study. Dr. Katherine Robins (1985:31) in her socio-economic survey of Ndeiya and Karai locations in Kiambu District noted that "cash income has been used as a measure of household's living

standards. This enables researchers to analyse socio-economic statuses of areas they study. However income is sometimes difficult to assess due to reluctance of people to reveal how much they really get in terms of money. In almost all cases rural families do not keep records of their spending. This poses the problem that what respondents say may be slightly exaggerated or deliberately under-estimated".

What therefore becomes crucial given the above observation, is the in-built ability of the research instrument, in terms of probing and control questions, to come to grips with this problem. As has been pointed out before, the construction of the research instrument attempted to take care of this but this does not totally rule out the suspicion we must always have about such data even after probing.

Another problem which had a bearing on the amount of the data that was obtained from the field was the lack of useful information from government offices. Either there is no systematically and consistently documented information or crucial documents like departmental annual reports are missing. This made it impossible to assess changes which have occurred over the years on certain focal aspects like agricultural production, rainfall, etc.

Closely associated with the problem of lack of critical information from government offices is yet another problem of impossibility to land appointment with some officers so that data simply becomes impossible to obtain due to failure of such officers to honour appointments. The bureaucratic structure and accountability procedure characterizing such offices made the researcher completely unable to obtain the required data from some officers. The same problem of failure to meet government officers was also experienced on the side of respondents where it was common to come across deserted homes or where household heads were always away. This was especially experienced in Nyang'oma sublocation where there was active gold-mining where men or sometimes whole families could disappear for the whole day. It was therefore common to visit upto three or at times four homes in given sampling directions in Nyang'oma. Re-visits could not be afforded due to the limited time and finances.

The last major problem had to do with lack of cooperation from some respondents which with regard to particular fishermen bordered on open hostility. This had two crucial effects : first, it partially explained why at the end of the questionnaire administration exercise only 139 out of 150 questionnaires

were managed. This was because an interviewer at times had to visit a number of homes before landing a willing respondent and thereby only managing very few questionnaires. This is therefore a drastic reduction in the sample size but which must be accepted and justified within the context of this problem. Second, it led to a compromise in the set sampling procedure by allowing many reselection of sample cases to replace those unwilling to be interviewed.

#### DATA ANALYSIS TECHNIQUES:

There are a variety of factors that are given treatment in the next Chapter as they relate to the central factor of agricultural production. The analysis techniques which are used can better be presented when a broad distinction is made within this spectrum of factors.

First of all there are those factors that relate to the variables referred to in objectives (i) and (iv) and which are further specified in the two hypothesized relationships like levels of agricultural production and the earnings that accrue from farm yields, the labour in fishing activities and the income it gets from such engagements, as well as earnings from fishing activities invested in agriculture. There are also those other factors which relate to objective

(v), the kind of factors which have been identified by the previous scholars to influence farm production which although very crucial in the evaluation of agricultural production, are not reflected in the hypotheses. They are handled under the second and third assumptions. The second assumption holds that such factors can only be applicable to the study area due to the farm neglect brought about by labour diversion to fishing activities from the agricultural sector. The third assumption holds that if such labour diversion was compensated for and measures suggested by the previous scholars were affected, then the fact of the study area's belonging to the lower agro-economic zone within the district could not constitute a problem that could lower farm production.

As concerns both sets of variables, the study relies on univariate analysis where the distribution of sample cases are examined with regard to single variables (without any relationship). Here measures like percentages and means are calculated for groups of sample cases as they relate to the variables. When it comes to the first set of variables, the questionnaires are first divided into those dealing with fishermen and fish traders, those belonging to those households with members in fishing activities and finally those relating to those households without any member in

fishing activities. The said statistical measures are therefore computed separately for the three groups. This enables comparison and the researcher is therefore in a position to establish the relationship between agricultural production and other variables and proxy variables like number of people in fishing activities, number of people in the same activities who remit money home, earnings from fishing activities invested in agriculture, daily hours and weekly days devoted to farm work by those in fishing.

#### STUDY LIMITATIONS

If one takes study limitations to be concerned with the extent to which study findings can be generalized, it is imperative that this section is presented here before we move to the next Chapter on data presentation and analysis. This is because it will afford the reader an opportunity to appreciate the data within a candid framework of shortcomings which no study can escape.

In this study, limitations should be noted with regard to its basic assumptions and some elements of its methodology. The core assumptions are that all rural labour is agricultural and that other factors aside from fishing activities, can only explain low



agricultural production in the study area through the latter as an intervening or test factor. While it is quite true that these need not necessarily be true unless objectively researched and verified, it was found necessary in this study to control for them under the assumptions so that it becomes possible to more sharply focus on the hypothesized relationships. Their relegation to the status of assumptions and not central hypotheses should be seen as a recognition of their presence and the possible effects they could also have on the level of agricultural production.

The other discernible limitation has to do with the study design which was chosen and this touches on the first limitation discussed here in terms of how effectively the study controls for other factors given the posttest only design. The argument already advanced in the study design section and the part explaining data analysis techniques where the reasons for dividing household sample into two and also having a separate sample of fishermen and fish traders were given should take care of this limitation. However for researchers with enough time and resources to conduct a pretest-posttest survey, better controlled results would be obtained but this should not dismiss the type and level of control this study has as unacceptable.

The limitation that relates to the quantitative data concerning the focal variables in terms of their reliability and plausibility as has been highlighted in data collection problems section should not be seen within the framework of this study alone. It would be misleading if one chooses not to see it within the context of the rural setting where the research was undertaken. As has been said already, such a setting is characterized by no kept records and inability to remember such figures, unwillingness to divulge the data and so on. For as long as this setting remains true to these characteristics, the limitation will remain generic to studies of this nature. Such studies should therefore be gauged on the basis of how effectively they attempt to sift such data in the field through the research instruments as has been attempted here.

## CHAPTER FOUR

### DATA PRESENTATION AND ANALYSIS

The primary concern of this chapter is to present, analyse and synthesise the field findings as well as verify the hypotheses and fulfil the objectives of the study.

It is already clear that the primary data on which this study relies is centrally based on two sample surveys: that of households involved in fishing activities, represented by fishermen and fish traders, and another group of households engaged in farming. For purposes of analysis of the data, the research instruments have been assessed in three categories. This is to enable the data to lend itself easily to the line of analyses adapted here which significantly rests on comparison of the various categories. This, it is contended, makes more effective the testing of the hypothesised relationships and the fulfilment of the set objectives as will come out by the end of this chapter.

The first category of respondents is constituted by those households without any member in fishing activities which comprise 64.8% of all households resident in the study area. Those households with one or more members in some fishing activity make up the

second category all of which constitute 35.2% of households in the study area. The third category comprises people in fishing activities, i.e. fishermen and fish traders themselves as heads of households. These categories will be hereinafter referred to as C1 and C3 respectively. There are however specific variables where the data of C2 and C3 are used to counter-check each other.

#### FACTORS AFFECTING AGRICULTURAL PRODUCTION:

It was argued in Chapter 2 that there are a variety of factors that have been shown, by previous scholars to influence low farm production and which have been tested in a number of areas. Measures related to these factors are also said to have been instituted in many places with varied success. In Chapter 1, it was stated that one of the objectives of this study was to find out the extent to which some of these factors are applicable to the study area. In this section, an attempt is made to present and analyse some of the survey findings about these factors to see whether and to what extent they still have a bearing on agricultural production in the study area.

Farm Technology:

The gist of the argument in Chapter 2 about this factor is that farm intensification through various forms of farm technology increases crop yield, employment opportunities on the farm and opens more land for cash crop economy. These issues will however become more clear after we have looked at the findings about agricultural labour, type of crops planted and the actual level of farm production.

Here, a comparison of the awareness and actual use of some of the selected farming techniques and inputs can give us an insight into what the real situation should be like as concerns farm technology. In Table 2 below two things are apparent: first, many farmers are not aware of many of the improved techniques and the inputs they can use to improve their farm productivity. Second, many farmers use a number of these techniques and inputs without really being aware of the fact that the primary purpose is to maximise farm production. This can be shown by Table 2 where those who are aware of these techniques are fewer than those who actually use them. Or if they are aware of the purpose of using these techniques, then they might not have a clue as to the approximate magnitude by which they can increase their

production. The result is that the application of such techniques and inputs is not always matched with the required attention and commitment. The result is that despite the use of these techniques and inputs, farm

Table 2: TECHNIQUES AND INPUTS KNOWN AND USED

NAME OF TECHNIQUE OR INPUT	POPULATION AWARE (%)	POPULATION USING (%)
Improved Seeds	16	35
Farm Machinery*1	-	56
Pesticides	-	-
Irrigation	-	-
Line Cropping and spacing	21	36
Consulting Extension officers	-	25
Fertilizer/manure*2	29	34
Not Aware	54	-
Not Using	-	30

\*1 Predominantly Ox-plough

\*2 Predominantly animal manure

Source: Survey Data.

production is still organized within the threshold of subsistence enterprise. On the other hand, if farmers are aware of this primary goal and even have a notion of approximate possible yield increase, then they lack adequate technological knowledge of the precise application requirements of these techniques and inputs.

From the above findings it can even be seen that the package nature of farm technology as argued in Chapter 2 seem to defeat the farmers in the study area because inputs like improved seeds, pesticides, fertilizer and so on do not go together. This obviously has a bearing on the low farm production which continues to be registered even at the above level of use of such techniques and inputs.

### Cropping Pattern:

It was argued that cropping pattern in terms of whether crops are mixed - or single-cropped, broadcast or planted in lines and spaced all have an influence on the amount of yield that accrue from the farms. It is however important to first look at the type of crops that are planted in the study area before we appreciate the manner in which they are planted. Table 3 below shows

that maize is the most popular crop in the study area grown by 92% of the people followed by millet which is grown by 87% of the people.

Table 3: DOMINANT CROPS IN BONDO DIVISION

CROPS GROWN	% FARMERS	% TOTAL LAND
Maize	92	25.88
Millet	87	24.72
Beans	68	} 49.4
Peas	39	
Potatoes	12	
Sim - Sim	21	
Cassava	29	
Cotton	31	
Others	56	

Source: Survey Data.

In the study area the crops shown in the table are basically planted during the long rains season only during which time the small portions of the land holdings which are tilled are put to maximum use by mixed cropping and seed broadcasting. 74% and 88% of the farmers intercrop maize and millet respectively with other crops,



mostly beans and peas, or the two crops together. Sometimes even cotton, sim-sim and cassava are variously interplanted with other crops in a spectrum of combinations. It has of course been seen in Table 2 that only 36% of the people practice any line cropping and spacing at all. This means that the majority still broadcast seeds and this definitely lowers crop yields.

Agricultural Extension Services:

It was found out in the field that 40% of the farmers are never visited at all by the agricultural extension agents. Of the 60% who are ever visited, prior to the administration of the household questionnaires 5% had been visited only once in the previous one month, 9% had been visited once in the previous two months and 51% once in the previous one year. The agents had not visited any farmer the week prior to the survey.

All the farmers who had been visited by the extension agents indicated that the officers explain and demonstrate to them the techniques and farm inputs they are supposed to adapt to increase their yields. This means that the approach used by the officers in 'extension' is still at variance with what the previous scholars suggested. The approach still remains advisory and does not develop the farmers' ability to independently undertake these tasks

which are meant to change their agricultural performance.

Table 2 has already shown that no farmer is aware that consulting agricultural extension officers is in itself a way of improving agricultural performance. Only 25% of the farmers had actually gone out of their way to consult the extension agents. Perhaps this can be tied to the finding that the agents themselves are not able to visit many farmers and even among those whom they visit, the frequency of such visits as presented above does not allow for adequate follow-up.

Field findings also showed that one extension officer is in charge of 800 farmers. Each officer is required to have personal contact with 48 farmers per fortnight and 6 contact farmers per day. This means that within about 7½ months, the agent is meant to have seen all the farmers under him but because of the shortage of extension agents, it is the contact farmers who are supposed to facilitate the adaption of improved farming techniques by first improving their farms and letting the other farmers learn from them. No farmer however indicated any contact with such contact farmers.

Going by the finding presented above, although the agents are far from being adequate for effective

extension work, the low frequency of their visit cannot possibly be wholly explained by such inadequacy, especially when cognizance is taken of the fact that 40% of the farmers are not visited at all and that 5% of those who are visited are only visited once a year.

Agricultural Co-operatives:

The survey established that 65% of the people in the study area do not know the types of co-operatives which had been established to assist their farming operations. Of the 35% of those who are aware of the co-operatives concerned with their farm operations, only 20% are actually members but even these only belong to farming collectivities like women or other community groups which do not in any way operate within the conventional framework of co-operatives. 80% of the people who are aware of the relevant co-operatives they can join are not members of any farming co-operative or collectivity. 71% of the people in the study area do not even know how co-operatives are meant to benefit members. The remaining, especially those who are actually members, articulated benefits like income improvement, buying farm inputs, advancing credit, savings, collective work, etc.

Given the above level of awareness of both the relevant co-operatives and the benefits associated with co-operative membership, it is not surprising that the majority of the people have not been able to buy the concept of co-operative movement as a tool for effective organization of agricultural production activities. Following from the case presented in Chapter 2 about the role of co-operatives in boosting farm production, it can therefore be said that the findings about the co-operative movement in the study area confirm that low agricultural production here is partly explained by this factor. The level of farm production presented later in this chapter should therefore be appreciated partly within the context of such apathy to co-operatives.

It however becomes worth noting that within the study area low co-operative membership is associated with low farm production. Survey finding showed that most of the people who are aware of the existence of the co-operative movement but were not members of any co-operative claimed that their farm produce was too low to justify their joining any co-operative. This has resulted in a vicious circle where weak co-operative operation hamper farm production and low production discourage people from joining co-operatives.

Marketing and Pricing:

It has already been articulated in Chapter 2 that the issue of marketing and associated factors like pricing and so on also become central in determining the level of agricultural production. Whether and where crops are sold and at what price are therefore all significant considerations in this respect. The fact that 64% of the people do not sell any portion of their produce at all is a useful indicator of the low level of agricultural production. It is also vital to note that the people who sell do so in the nearest or distant periodic or otherwise markets, at home, etc. and do not channel their sales through institutions like the K.G.C.U. or other forms of marketing collectivities. This underscores the role of such small local markets to the small farmer who just has a couple of bags to sell.

The markets where the farmers sell their produce are on average 3.88 km. away from such producers, with 65% of the producers being within a radius of at most 3 km. of a market. Because of such short distances and the small amount of crops that is sold, 61% of the people transport their produce by headloading while 31% of them transport by animals.

The capacity of such markets to handle the available 'disposable' crops is also a factor that can not be ignored. 66% of the people have problems during the months of July and September which coincide with the harvesting times of both the study area and neighbouring divisions. During such times it is common for sellers to take their produce several times to the markets and fail to sell them each time. This of course alternates with other times when the markets do not handle enough crops to satisfy demand. The markets' capacity must therefore be seen within the framework of periodic fluctuations of crop availability.

Agricultural crop prices also fluctuate inversely with crop availability. The above position about marketing and pricing presents quite an ugly face if one is to talk of improving other facets of farm organization without a concomitant facelift of marketing. As was argued in Chapter 2, any organization of agricultural marketing and pricing which remains at the level of institutions like K.G.G.C.U. and other co-operatives and aims at reaching the small farmer therefore misses the gun. The small farmer can only be affected if the marketing facilities and price control system are extended to the small markets where he operates or if his production is boosted to a scale where he will find it worthwhile to sell through such institutions.

Storage Facilities:

The survey finding was that only 3% of the people in the study area have any storage problems. The produce which is harvested is generally stored inside residential houses or in the traditional granaries erected outside such houses. Field survey showed that 77% of the people stored their produce inside their residential houses, 21% stored in the traditional granaries while 2% had separate houses used specifically as stores.

The fact that the majority of the people do not have storage problems and can safely and comfortably afford to store their produce hints to the fact that agricultural produce in the study area is not so high as to necessitate giving any attention to the storage problem. There is therefore very little case for investment in extra storage facilities like the ultra-modern maize store in Bondo town which perpetually operates under capacity. There is a stronger case for first looking into ways of improving agricultural production in the study area to warrant such massive investment in storage facilities.

Transportation/Farm Access:

Apart from looking at the factor of transportation in terms of how farm produce is ferried to the market, it can also be viewed in terms of accessibility to the farm plot. It was found that 90% of the farmers are on average 2 km. away from some form of motorable access road while 10% are more than 3 km. away from any motorable access road. 16% of the people are directly served by the Kisumu - Usenge tarmac road that traverses the division while the rest are served by other murram roads that can be seen in Map 3, Chapter 3.

Because the factor of farm accessibility is crucial in agriculture due to the role it plays in the transport of both farm inputs and produce, it is useful to consider the findings above within the framework of farm technology and production levels currently found in the study area. It will be seen that 'motorable' access to farm plots will not be meaningful if the amount and type of inputs used do not presently call for such an elaborate and efficient access and if the current levels of farm production still need only headloading and animal transport.



Farm Size and Land Fragmentation:

To appreciate the field findings concerning this variable it is useful to call to mind the argument in Chapter 2. It was said that larger, unfragmented farm plots make easier farm mechanization, do not lead to waste of labour by operating many separate land parcels and enables the farmer to have freehold title for relatively bigger parcel which can be used as collateral for agricultural credit. It was also indicated that Mbithi's findings in Kigezi established that those with bigger parcels do not necessarily exploit such postulated advantages. It was therefore concluded that the factor of farm size must therefore operate within a package of other considerations to influence farm production. In the study area, although the farm size per se is crucial, an overriding issue is the portion of the land parcel that is actually put to use.

The field survey showed that an average household of 6 persons in the study area occupies a mean farm size of 3.94 acres. This should however be seen against the background of the finding that 29% of the people have less than three acres and 80% have less than 4 acres of land. Only 20% of the people have 5 acres and above.

Of the above farm holdings a proportion of 40.46% is tilled on average among C1 households which means that out of the mean holding of 3.94 acres, only 1.59 acres are cultivated. 67% of the people have put to use less than half of their farm holdings. Only 20% of the households have put the whole of their parcels to cultivation. 5% of the people have not tilled any portion of their land. In C2 type of households, only 33.41% of the average 3.94 acre holdings is tilled which is actually 1.3 acres. In fact 95% of C2 households had put to use 50% or less of their farm plots with 52% tilling 25% or less of their pieces of land. 55% of the uncultivated land among C1 and C2 households was used for grazing, 27% was fallow while 18% was put to other uses.

The fact that much of the land is not cultivated ties with what is also stated in the current Siaya District Development Plan and the 1986 Annual Report for the Ministry of Agriculture and Livestock Development. Both of these sources rely on a survey carried out by K.R.E.M.U. (1984) which puts the portion of the uncultivated land at 78.2% on average for the division. The breakdown of land utilization is given in the table below. The figures in Table 4

Table 4: LAND UTILIZATION IN BONDO DIVISION

LOCATION	LAND UTILIZATION					TOTAL
	UNDER CROPS (%)	BARE GROUND (%)	GRAZING (%)	FALLOW (%)	BUSH (%)	
Yimbo	19.9	0	15.6	32.8	11.7	100
North Sakwa	29.4	1.8	29.7	11.3	31.4	100
South Sakwa	19.3	1.5	19.3	42.9	20	100

Source: Land-use in Siaya District; 1984 by K.R.E.M.U.

Obviously do not coincide with the survey findings but both give the impression of big chunks of uncultivated land. As Chauhan (op. cit.) said that the "capacity in use or in actual practice" is more relevant than the "ultimate basic capacity," the actually tilled portions of farm holdings become more relevant to this study. In any case no respondent indicated that land fragmentation was an impediment to his agricultural production and only 11% of the people felt that small farm sizes impaired their farm production. Although we cannot totally rely on the farmers' perception of their farm problems, it is hard to see small farm size as a hindrance

to farm production even before that small farm holding is made full use of in terms of cultivation.

### Climate and Soils:

The survey finding that all the farmers in the study area plant their crops in only one season—during long rains - of the year is in support of the argument in Chapter 2 that climate and soils have a bearing on farm practice and hence overall agricultural production. It was also said in the background given in Chapter 1 that the amount and temporal distribution of rainfall operate with the lean nature of the soils in such a manner that only one cropping season is possible during the long rains in the study area.

It was found that 55% of the people expressed their farming problem in terms of lack of rainfall. But it should be noted that all these people expressed this problem in relation to the short rains and the fact they are not able to grow crops during this season. However, the amount of rainfall received during this planting season amounting to 587 mm. on average is enough. The problem then could be seen in terms of its temporal reliability as indicated by the fact that 6% of the people felt that difficulties in knowing when to expect the rains leads to late planting. Full argument about the rainfall's

reliability and its relationship with farm production is however presented in Chapters 1 and 2. Apart from the fact that the soils in the study area is not deep, it does not have any problem, especially to do with fertility. This is even reflected in the finding that only 4% of the people mentioned poor soils as being a problem that impinges on farm production.

### Policy Formulation:

The discussion of policy formulation in Chapter two revolved around the issues of relevance and effectiveness of policy measures to the target groups. Factors like timely, reliable and usable data, and consultation with the target population were postulated to enhance such relevance and effectiveness. Kenya, along with many developing countries, was postulated to have ineffective agricultural policies largely due to these three factors. It was also seen in the same chapter that the focus of Kenya's agricultural policy is the "small farm" using such strategies as farm technology and intensification, market incentives such as fair prices and prompt payment for crops delivered to parastatal bodies, credit provision and development of co-operatives. The question that therefore arises is whether such policies have been effective in reaching

the small farmer as we reach the end of the plan period.

The field findings and discussions about the factors addressed by policy like marketing, and pricing, credit facilities, co-operatives, farm technology and so on can best be used to test whether Kenya's agricultural policies have really reached the small farms. Such findings and discussions show that field realities in the study area have remained quite in disagreement with the government policy programmes and targets stated as early as 1984. Policy statements have tended to be enthusiastic pronouncements which are often not synonymous with practicable policies which are supported with concrete back-up measures such as finances, manpower and effective institutions like well-run co-operatives.

#### Agricultural Labour:

The subject of agricultural labour can best be treated by first taking stock of the available population in terms of size, age/sex structure and quality in terms of education levels and training. This is assessed on the basis of findings in C1 and C2 category of households. It had earlier been said that an average household in the study area has a membership of

6 persons who should work and largely depend on an average of 3.94 acres of land. Against the background of this average acreage on which the household expends its labour, it should be observed that 75% of the households have 5 and above persons while 22% have 7 and above members. 8% have 9 to 10 members. This when viewed within the framework of farm organization as well as returns points at the question of whether such land parcels are really capable of adequately employing all the labour, especially of the larger households, with present farming methods.

Table 5 below shows the size of the same population available for agriculture along the dimension of its age/sex structure. 50% of the population is below 14 years of age and are hence dependent on the remaining 50%, many (33.3%) of whom are in fishing activities where, as will be seen, their absence has a negative effect on agricultural production since they do not invest anything commensurate on agriculture. Out of this population, 63.6% undertake agriculture as a primary occupation and 36% as a secondary occupation.

Table 5: AGE/SEX STRUCTURE OF STUDY AREA'S POPULATION

AGE GROUP	MALE (%)	FEMALE (%)
0 - 4	9	11
5 - 9	10	9
10 - 14	5	6
15 - 19	4	5
20 - 24	4	4
25 - 29	3	5
30 - 34	2.5	3.5
35 - 39	3.5	2.5
40 - 44	2	1
45 - 49	2	2
50 - 54	0.5	1.5
55+	1	1
Total	46.5	53.5

Source: Survey Data.

In terms of the quality of the agricultural population, 27.5% of the people in the study area do not have any education while 44.7% have education of standard 8 and below. 27% have secondary education. The fact that 27.5% of the people have not gone to school does not augur well for the case of agricultural



advancement especially in relation to extension services and the application of improved farming methods.

The survey did not come across any respondent who had undergone any kind of agriculture - related training. In fact 83% of the people did not have any form of training. 11.5% had trained in some form of technical skills, 5% had various forms of professional training and 0.5% had undertaken commercial courses. These cannot directly help agricultural production in any significant way taking account of the existing farm situation.

The next crucial issue about farm labour is the question of who actually works on the farm. From the findings in C2 category of respondents it is apparent that women and children (below 15 years of age) are the most frequent people on the farm. This is because they are involved in farm work in 73% of the cases. In 19% of the households, only women work on the farm, children alone work in 4% of the household farms while in 26% of the cases, the women and children work together. Only in 34% of the households do the whole family (men, women and children) engage in farm work. The average age of children who work on the farm is 10.5 years with 67% of the cases having children between 10 and 15 years

participating in farm work and 33% of the cases with children ageing 9 and 10 years as part of household agricultural labour.

In C1 category of households, the position is even more critical because women are involved in 56% of the cases, children in 42% of the cases, men in 32% and workers in 15%. It is vital to note that the child labour presented above must be seen in the context of the fact that the children have to work on the farm on top of going to school. This of course reduces their time on the farm and leaves even heavier burden on the women.

The above figures for C type of households should be seen in the light that more men have taken to fishing activities leaving behind their wives and children to till the land. Fewer women relatively have got into fishing leaving their husbands and children to work on the land. In any case, the women who are in fishing activities are fish traders and often work on their farms before going to the market later in the day. Either way, children and women are still by and large the pillars of the study area's agriculture.

It should be said that the men and women who have

taken to fishing activities in both C2 and 3 type of households spend very little time on their farms. On average, the in C2 were found to devote 0.7 of a day a week and those in C3 devote 0.8 of a day a week to farm work. 43% of those in C3 do not dedicate any day to farm work while 38% devote one day, 13% two days and 6% 3 days to work on their farms. These figures should be compared to corresponding percentages in C1 households where people devote an average of 6 days a week to farm work with 75% giving 5 day or more to agricultural activities, 90% give 4 and above days and 10% give 7 days a week. For these C1 farming days, an average of 5 hours are spent daily on the farms with 55% spending 5 and above hours daily.

Following from the population figures given already where it was established that 50% of the population is below 15 years, it can be inferred that for an average household of 6 people, three persons are below 15 years of age. This means that only the three remaining members of the household are the productive people who must till the 40.46% of the 3.94 acre land parcel to produce the quantities of crops that will be given later C1 households. Probably the finding that 65% of the C1 households hire extra

labour at the critical periods of the crop cycle is an indicator that the available labour cannot cope with the work at such times. This finding could be found to nullify the suggestion made earlier that the farm sizes in terms of the tilled portions and organization might not be able to employ fully the larger households. This is more so when we take account of the finding that on average C1 households employ 4 farm hands during the labour peaks. This means that even households with 10 members would be fully engaged during such peaks. Maybe a more grave issue now is whether the labour would find full occupation that runs even through the labour troughs. Most probably this would come with full utilization of the available land parcels and the application of improved farm technology.

If in C1 households the labour situation is so acute during the labour crests, it shows that in C2 and C3 type of households, the labour that is left on the farm is far from adequate - especially given also the age/sex characteristics of those who mostly migrate into fishing activities as will soon be presented. The expectation would therefore be that funds are fed back to agriculture from the alternative activities that have taken labour to correct the imbalance.

The field data however shows that only 15% of C3 households and 11% of C2 households hire labour which of course make the expectation unfulfilled. C1 households hire on average 4 farm hands per season or per year given only one cultivation in a year as already noted. 50% hire 5 persons or less. This should be looked at vis-a-vis the finding that C2 hires an average of 3 farm hands for the same period with 66% hiring 5 or less workers and 34% hiring more. This means that hiring farm hands as a form of re-investment in agriculture is still very low among C2 type of households whereas the indication is clear that the available farm labour in this category is far from being enough.

The cost of hiring labour per season taking the case of C1 households does not reflect well when viewed within the context of agricultural earnings to be peresented later. Small farmers therefore continue to be caught up in Gwyer's mentioned "low level equilibrium" where farms cannot be properly tilled due to labour shortage and labour cannot be hired due to low incomes and incomes cannot be raised due to perennial low productivity resulting by and large from land parcels which are not fully utilized.

It should be remembered that in C2 a number of questions were raised about agricultural labour. It is worth noting here that these questions cannot be adequately answered by this section alone. To understand why the agricultural sector in the study area cannot employ capacity labour, which best farm organization can enhance such capacity employment and ensure that the labour is retained within the sector, one will need to appreciate factors like farm technology and crop earnings. The factor of agricultural and fishing incomes will also help to establish that the "prime mover" of the people out of the agricultural sector is the income differentials. Thus although the findings in this section, reveal a number of factors influencing agricultural production, these must therefore be together with findings on other factors in this chapter.

#### Agricultural Finance and Input Prices:

The basic argument in Chapter 2 about the above factor was the question of accessibility of credit facilities to small farmers to enable them acquire farm inputs to improve their production. This was in connection with the collateral terms set by the financial institutions. The survey found that 76% of the people had no property other than land which they could

mortgage to get credit. 13% had business enterprises like shops, bars, etc. while 7% had physical investments like rental houses, cars, etc. and 4% had bank accounts.

The above findings therefore mean that if so many people have only land as a possible collateral then the people who use it most should have franchise to use it as security when necessary. Whether this is the case in the study area will be seen in the next section. 65% of the people however said they cannot mortgage their land parcels for credit and they had quite some reasons for this: 24% could not do so because they were "only wives" and the husbands reserved the say in such an issue. 39% feared defaulting and the resultant possession of the mortgaged asset by the financing institutions while 19% could not do so because they had no title deeds. 18% had plots which they felt were "too small to be mortgaged." Because of one or a number of the above reasons, only 6.4% of the people had ever acquired credit and of these, 25% did not use their land as collateral.

Many people, especially political functionaries and government officers, have tried to popularize the contention that despite the fact that the government offers credit facilities to farmers, farmers have just opted not to use them without any good reason. There

is however much more truth than meets the eye about why such apathy exists and some possible explanations have been offered in Chapter 2.

It was found in the field that 49% of the people are not even aware of the available sources of credit should they want to acquire loans for their farm improvement. 34% are ware of the facilities offered by the Agricultural Finance Corporation (A.F.C.), 8% by Siaya Teachers' Savings and Credit Society (STSCS), 6% by commercial banks and 3% by K.G.G.C.U. But despite this knowledge, the people who have actually acquired credit from the various sources constitute a mere 6.4% and even then, those who have used such facilities have taken credit only once between 1981 and 1987.

It is however interesting to point out that 37.5% of the credit which was purportedly acquired for farm improvement ended up being invested in non-farm-related ventures like starting petty trade. Most of this is credit which is acquired from other institutions and not A.F.C. and for which beneficiaries are not followed up to ensure that credit is channelled into the intended projects. Of the people who had invested such credit in agricultural improvement, 66% achieved an average of 4.5 bags yield difference. What would be the ideal



yield difference is however hard to precisely determine because of unpredictable manner of investment on farms - some would use the credit for the expansion of their cultivated fields under present farming methods, others would intensify their use of the presently cultivated portions by modern farm technology, etc.

Taking cognizance of the fact that on average Kshs. 2,340 worth of credit is acquired by each farmer and viewing this vis-a-vis the average yeild without credit as given later in this chapter (assuming no significant financial input apart from the labour whose costs will also be given later), the above average yield difference is far below expectation and can only suggest that the credit is misapplied - an apparent indication to lack of or inadequate follow-up by lending institutions or/and technical advice by the extension staff to enable farmers to invest in viable and profitable agricultural production ventures. This means that returns are low and this might partially explain why the Siaya A.F.C. Branch Manager put the percentage of defaulters at 95% of borrowers ; almost equal to saying that in the study area, borrowers are synonymous with defaulters.

The argument in Chapter 2 was that the position of the small farmer is so desperate that he cannot effectively make use of the measures already instituted by the government to improve his farm unless he gets some starting agricultural finance. The findings about the other factors presented above actually support this argument but the findings about the accessibility and use of credit facilities show that such finances cannot be got even through the established credit institutions. This implies that the farmers therefore have to rely on their meagre incomes to improve their farms. It would therefore be worthwhile looking at the composition of the sources of income received by households in the study area.

The aspect of this composition which becomes relevant to this study is however the finding that 61% of the incomes accrue from farm earnings. This means that the other sources are not as basic as farming and if anything is to depend on household incomes then it has to depend by and large on incomes derived from farm activities. In this study we are talking about the improvement of agricultural production - an improvement which really boils down to the dire need of agricultural finance. What this implies is that if such improvement is partially hinged upon finances available at the

household level as articulated earlier, then agriculture must largely finance its own improvement. But the lingering question is: to what extent is this possible given the low agricultural income levels (to be seen later) vis-a-vis the costs associated with such improvement?

The above is a vicious circle which traps the small farmers even more in Gwyer's "low level equilibrium" so that unless 'accessible' credit or any form of agricultural finance is made available to such farmers associated with effective follow-ups, they will continue to lack the resources needed to usher them into the market economy.

#### Land Tenure:

The issue of right over land is significant in rural communities because it has a direct bearing on the use of household land parcels. The patrilineal heritage of most Kenyan rural communities means that only fathers and sons (men) hold title deeds and hence have decisive say over the use of land.

During the survey, the issue of credit facilities became a heuristic factor that led to the inquiry about the land ownership situation. It was established in the study area that 83% of the household farm plots are

registered under fathers' names, 4% under sons, 11% under the two together and only 2% under mothers. This means that in 98% of the cases, land is registered under men.

The above figures can conflict with the finding that most agricultural production activities are shouldered by women and children. It means that even if women constitute the bulk of the farm labour, the critical farm decisions as which plot is to be cultivated which season and what crops to be planted, whether or not a plot can be mortgaged to secure credit, etc. are still made by the non-participant (and often absent) men. This could have adverse ramifications for farm production as Gwyer (op. cit.) was noted to say because farm decisions are often delayed due to such consultations or even totally hindered by the absentee male 'farmers'.

The above position has specific implications for the use of credit facilities for those households that qualify and are willing to make use of such facilities, as is already noted in the preceding section. This is because the people who actually work on the land can not on their own accord use the same land as collateral to acquire credit. Findings about the use of credit facilities were in support of this.

Labour in and Remittance from Fishing Activities:

The argument throughout this study has been that the labour diverted from the agricultural sector to fishing activities hamper farm production by the gap created which is not bridged by any remittance from such activities to that sector. It is therefore worthwhile here treating the above alongside other factors that are postulated to impair production. In this section the findings about such labour is considered along a number of dimensions like size, age-sex structure, education and training, etc. because all these help to throw some light on the characteristics of the labour that is drawn by fishing activities. Even findings about the level of operation by those in fishing activities are considered here because this is argued to have an influence on incomes and therefore the amount which can possibly be remitted to agriculture.

The survey discovered that 16.66% of the people interviewed were engaging in fishing activities as their primary occupation. But apart from looking at this size of the population in fishing activities, it is vital also to look at it in terms of its age sex structure on the basis of C2 and C3 type of households. In Table 6 it is clear that most of those in these

activities are concentrated between the ages of 15 and 44 years. C2 type of households has 75% men and men and 25% women) within this age bracket and C3 households has 86% (57% men and 29% women) within the same age bracket. 80.5% on average is between this age bracket. Those between 45 and 59 years of age are 19% for C2 and 14% for C3 households or 16.5% on average. The trend that comes out from the above table, apart from the fact that most of those in fishing activities are those in their most productive ages, is that there are more men in such activities than women as

Table 6: AGE-SEX STRUCTURE OF POPULATION IN FISHING ACTIVITIES.

AGE-GROUP (YR)	C2 HOUSEHOLDS		C3 HOUSEHOLDS	
	MALE (%)	FEMALE (%)	MALE (%)	FEMALE (%)
Under 15	5	1.5	0	0
15 - 29	27	14	22	13
30 - 44	23	11	35	16
45 - 59	15.5	3	11	3
	70.5	29.5	68	32

Source: Survey Data.

would be expected. C2 households have 70.5% men and 29.5% women and C3 households have 68% men and 32% women engaging in fishing activities. On average there are therefore 69% men and 31% women in fishing activities who have stayed in these trades for a mean of 5.96 years with 49% having been in their engagements for over 6 years.

As concerns the scale of operation of those in fishing activities, the findings in C2 indicate that 53% of the people in this sector are employed by either canoe owners who make up 13% or those who trade as business owners who form 26%. Itinerant fish-mongers constitute 8%. The bulk of the work involved in both fishing and fish trading was found to be shouldered by the employed because the employers do only the supervisory work. The incomes that accrue from these activities is however not distributed proportionately because the employers were noted to claim a share of at least 60% of such incomes.

The above finding about income distribution could even partially explain why money is not reinvested in agricultural production activities by most of the people as will be seen - most people apparently do not have reasonable disposable incomes so that lack of such

re-investment could in part be due to unaffordability rather than negligence or unwillingness. But the former could only be true if the figure for those that do re-invest in agriculture approximate the figure for those (employers) who handle the bulk of the fishing incomes - this is not the case as will be established shortly here.

Findings from C2 type of households about where cash remittances from fishing activities are invested show that farm improvement is the most neglected. It was found in the survey that 88% of the households with members in fishing activities receive remittance from such activities while 12% do not. But of the households that receive such remittance, 69% invest it in subsistence needs. Although this in the final analysis serves the same purpose food production could have served, this version of the argument is not applicable in this study because the concern here is boosting agricultural production in the study area. Dependence on the market for food requirements will mean that such food crops will have to be imported into the study area. The study area will therefore have to forego all the other benefits associated with having to grow such crops locally as articulated in Chapter 2.

Only 4% of the people were found to invest all the remittance in farm-related ventures aimed at raising



agricultural production. 8% invest in both subsistence and farm - related ventures while the rest channel it to other lines like school fees, etc.

Of the people in the fishing activities who give any remittance, 35% remit Ksh. 100 or less per week, 72% give Ksh. 200 or less per week and the rest give above this. All this gives an average of Ksh. 164.86 being weekly remittance per person in fishing activities (and in deed per household given the average of one person per household in such activities). Of those households which invest any portion of this money in farm-related ventures, only 35% put over 75% of this remittance to such investments and 65% invest less than 50% of this cash in agricultural production activities.

An aspect of labour in fishing activities that is also crucial is the quality of education among respondents. This obviously has a bearing on the performance in such activities and also has implications for agriculture from which, it is assumed in this study, such labour is drawn. The data obtained from C2 and C3 households do not however significantly agree as is seen in Table 7. However they find unity in the fact that the majority of the people (averagely 65%) have below standard 8 eduction, 18.5% have attained standard 7/8

certificate while only 16.5% have secondary or high school education. These findings when compared with the education levels of those left in agriculture show that fishing activities do not attract people with high levels of education generally.

Table 7: EDUCATION LEVEL OF THOSE IN FISHING ACTIVITIES

LEVEL OF EDUCATION	POPULATION (%)	
	C2 HOUSEHOLDS	C3 HOUSEHOLDS
High/Secondary school	21	31
Standard 7/8	13	23
Below Standard 7/8	36	17
No Education	30	39

Source: Survey Data.

The level of training of such labour also becomes a useful consideration in an attempt to gauge the quality of the same, especially if there is anybody trained in any skill that can assist him in his operation in the fishing activities. Worse than the situation in education levels is the fact that 90% of the people in fishing activities do not have any form of training, only 5.5% and 4.5% have some form of professional and technical

training respectively which have nothing to do with their engagements.

Although not as directly related, the above findings should, of necessity, be appreciated against the background of Mbithi's and Sandberg's findings already referred to in Chapter 2. They found that income differentials between different sectors of employment constitute the force that operate the push and pull dynamics which make people drift out of the agricultural sector to better paying areas. They established, it has been said, that the men, the young and the educated are the most mobile in response to this force. The figures presented here with regard to those who drift to fishing activities are true for the men and the young but not for the educated.

Income differentials between agricultural and fishing activities for the majority of the people is much more perceived than real when cognizance is taken of the finding that the actual difference is only relevant to the few who own businesses and canoes and employ labourers whom they pay uncommensurate wages. Many people who are subject to this drift could be pulled by the perceived incomes in fishing activities but get themselves held to their work by their aspirations of

buying boats or starting businesses in future even if the income realities in fishing activities have frustrated their expectations. In any case it was found that while employees are 24.9 years on average, employers were averaging 39 years of age: maybe the longer one stays and the older one grows in the engagement, the more stable and established he becomes financially thereby enabling him to buy a boat or start a business.

As will be seen later in this chapter, it should be noted that even the uncommensurate incomes of those employed in the fishing activities are still better than those in agriculture. This is because if the income earned in the former is Ksh. 2380 on average and the employers were said to reap 60% of this, the employees will still have Ksh. 952 per month on average. This is more than double the Ksh. 450 farmers are left with after the sale of crops and buying of extra crops for consumption.

Within the context of the above situation, farmers couched their plight in terms of the problems enumerated in Table 8 below. The table also includes some solutions for the alleviation of the problems from the farmers' point of view.

What is clear from Table 8 is that farmers already are capable of seeing the problems they encounter in

their endeavour to raise farm production. They do not necessarily have to articulate them in the manner done in this study. But what is important for planners and policy makers to understand is that farmers are already aware of what needs to be done to improve their lot. The efforts of the former to formulate policies and plans in an attempt to raise agricultural production therefore do not start on a blank slate or an empty bag into which they can stuff any armchair or conventional policy programmes. What is suggested here is that planners' endeavour to improve the lot of farmers ought to start with a survey and an understanding of the particular dimensions along which local farmers perceive the above problems and the background against which they offer the solutions. Planners should relate such perceptions and backgrounds to local resource practicalities and tailor locality- specific policy programmes that are not at variance with people's cognition of their own situation and resource ability. This should be the procedure through which policy and planning proposals should be generated from the grassroots in the present District Focus for Rural Development.

The above suggestion is made in view of the findings presented so far about the factors above which establish that although engagement in fishing activities

Table 8: PROBLEMS IDENTIFIED AND SOLUTIONS OFFERED BY FARMERS

PROBLEMS EXPERIENCED	RESPONDENTS (%)	SUGGESTED SOLUTIONS	RESPONDENTS (%)
. Lack of Rainfall	55	.Irrigation, Planting Trees	11
. Weeds	20		
. Late Planting	6	.Early Planting	6
. Wild Animals	31	.Game Department Interventions	30
. Pests and Diseases	8		
. Inferior Farm Implements	52	Modern Implements	41
. Lack of Capital	46	.Capital-Loan	40
. Poor Transportation/Accessibility	23	.All Weather Access Roads	17
. Lack of Technical Knowledge	41	.Extension Service	53
. Small Farm Sizes	11		
. Lack of Enough Labour	7	.Enough Labour	6
. Soil Erosion and Poor Soils	4		
. Lack of Farm Inputs	26	.Farm Inputs Close to Farmers	19
. Lack of Storage Facilities	3		
. Lack of Marketing Facilities	9	.Agricultural Cooperatives	5
. Low Agricultural Prices	19	.Fair Agricultural Prices	
. Little Time Devoted to Farm Work	8	.More Time on Farms	
. High Farm Input Prices	13	.Cheap Farm Inputs	21

Source: Survey Data.

have a bearing on farm production, other factors also remain applicable to the study area. Engagement in fishing activities therefore only explain low farm production by a limited margin (to be presented later in this chapter) but do not nullify the operation of the rest of the factors in the study area.

#### LEVEL OF AGRICULTURAL PRODUCTION AND CROP EARNINGS:

After presenting the scenario of the small farm situation as defined by the operation of the above factors in the study area, the most immediate question that arises is : how much yield and crop earnings do the small farmer come out with from such a farm situation which is fraught with so many problems?

It has been pointed out earlier that maize and millet, being the most dominant and basic staple crops, will be used more to indicate the agricultural production situation in the study area. To appreciate the production levels, it would be a useful start to consider the acreage devoted to each crop of the tilled portions of the land parcels. The mixed nature of cropping presented earlier actually overshadow the precise acreage devoted to each crop due to the characteristic problem of double counting. But taking account of this problem, the finding was that 25.88% of the tilled land is devoted to maize, 24.72% devoted

to millet and the rest 49.4% to other crops. These are based on C1 households. Out of the average land holding of 3.94 acres, this means 1 acre, 0.97 of an acre and 1.95 acres respectively if all the land parcel was to be put to use. But because this is not true, it means 0.4, 0.39 and 0.78 of an acre respectively taking account of the tilled portion only. These computations are on the basis of C1 households. They help to indicate the weight given to various crops and should not be related to per acre maize and millet production because they assume single cropping which is not a true reflection of the real situation. The fact is that acreages under particular crops could even be above these figures given intercropping.

Average household maize yield for C 1 households is 3.64 bags with 50% of the people producing below 4 bags and 36% harvesting below 2 bags. The corresponding figures for C2 households are 1.96 bags with 57% producing below 4 bags and 34% below 2 below 2 bags of maize. C3 households have an average household maize yield of 1.44 bags with 91% producing 4 bags or less and 69 producing 2 bags or less.

Average millet yield per household for C1 households is 2.7 bags and 45% of the people have yields of 2 bags or less while a whole 75% produce 4 bags or less. C2 households produce an average



of 1.3 bags with all the farmers producing 2 bags and below of millet. C3 households harvest an average of 2.67 bags of millet with 47% of the people producing 2 bags or less while 90% produce 4 bags or less. Although C3 households' figure for millet production is above that for C2 households, both still fall below production figures for C1 households. This maintains the trend shown by the figures above that C1 households' figures are consistently above C2 and C3 households' Figures and C2 figures are in most cases above C3 figures for crop yields. The above production figures for the three categories are presented in Table 9.

Table 9: CROP YIELD BY HOUSEHOLD CATEGORY

YIELD IN BAGS	MAIZE			MILLET		
	C1(%)	C2 (%)	C3 (%)	C1 (%)	C2 (%)	C3 (%)
Below 1	-	-	69	10	-	15
1 - 2	36	34	50	35	69	32
3 - 4	14	23	12	30	22	43
5 - 6	13	43	9	10	-	6
7 - 8	17	-	-	7	-	4
9 - 10	9	-	-	8	9	-
Over 10	11	-	-	-	-	-

Source: Survey Data.

If we use the figures already presented of acreages under various crops as a basis, it should be appreciated that if all the household labour was to be present and cultivate the whole of their land parcels, the yields could shoot to 9.1 bags of maize and 6.7 bags of millet on household average and with present farm practices. This potential figure is based on the finding already stated that 0.4 and 0.39 of an acre will yield 3.64 bags of maize and 2.7 bags of millet respectively. This means that 1 acre and 0.97 of an acre under maize and millet respectively if all the plots were tilled would give such potential figures. From the figures in Table 9 it can therefore be seen how far below each category is from this potential.

The above production figures if taken as they are to compute earnings would actually hide alot of truth if they are not corrected by the consumption and sales factors as well as other obvious costs that are associated with the production of such crops like that of hiring labour. It is the figures which will be arrived at after such considerations and assessment that will be more relevant in this study. This is because the argument throughout the study has been about the net and therefore disposable farm incomes that can be used to improve the production. Consumption and sales figures are derived

from C1 households alone because such households have not been affected by fishing activities and therefore would portray the practical picture of a complete household's consumption and crop sales.

Out of the average yield of maize (3.64 bags) and millet (2.7 bags) reported by C1 households, 3.3 bags of maize and 2 bags of millet are sold leaving the households with hardly anything to consume. This is because the consumption needs as reported by the same group are 2.7 bags of maize and 3.4 bags of millet which far surpass the quantity left after sale.

It is useful to point out that the above figures must be appreciated in view of the fact that rural people are not able to give totally precise figures about their farm operations. This is due to either lack of kept records about these activities and transactions or deliberate over - or under - estimation depending on what the respondents construe the purpose of the survey to be. For example, if they think that the survey is intended to help them solve their farm problems, their responses are likely to be different from those given if they thought that an interview schedule was just another survey like the others they have been exposed to before which they feel did not help them.

But on the basis of the above figures, which the survey tried to probe for consistency and reliability, there is however a useful indication to the fact that production is low and most people rush to the market to sell most of their little produce leaving themselves with almost nothing to consume. This is notwithstanding the fact that the produce itself is not even enough for household consumption. This is why it was found that 71% and 74% of C1 and C2 households respectively have to buy more maize and millet for food during periods of acute crop shortages.

We have already seen that with the present farming methods, the average land holding is capable of producing 9.1 bags of maize and 6.7 bags of millet if the household labour is not diverted anywhere and if the whole land parcel is tilled. The 1986 District Annual Report for the Ministry of Agriculture and Livestock Development says that the annual maize consumption requirements for a five-member households is 12 bags. Jaetzold (1982) says each individual needs 120 kg. of maize annually in the rural areas. From the two sources, our six-member household needs 14.4 bags or 8 bags of maize respectively annually for its consumption. Whichever figure one goes by, it means that the present production levels are very low (especially seen against the sales figures) but there is still some under-utilized

potential both within current farming methods and within improved farming techniques which could surpass the Jaetzold figure to approximate the Ministry figure.

We have already said that 3.3 bags of maize and 2 bags of millet are being sold on average per household on the basis of C1 households. The incomes that are derived from these sales are Ksh. 639.6 and Ksh. 616 respectively. Field survey revealed that the households also get Ksh. 511.58 from other crops, especially beans and peas. These figures are arrived at by considering sales in the local markets which were argued in Chapter 2 to be relevant to and used by these farmers. The field findings in this chapter about local market outlets also confirm this. Because there is only one cropping season in a year, the above are annual figures which means that the total yearly farm earnings in Ksh. 1827.18 which gives a monthly figure of Ksh. 152.27.

The earnings from maize and millet show that the two crops on average sell at Ksh. 193.8 and Ksh. 308 per bag respectively. This hints at the value attached to millet in the study area as a result of the fact that meals prepared from it are not consumed as much as those prepared from maize and this makes it last longer than maize. It is because of this that it

is even more demanded and expensive in slack periods.

It is important to bring in the issue of hiring labour at this point. On the average, C1 households use Ksh. 203.85 per year to hire farm hands. This means that each hand costs Ksh. 50.96 per year. It had been hinted that cash from crops is made total mockery of when consideration is given to the fact that almost all that is produced is sold without duely thinking of household consumption needs which are actually more than the total production. This is because what is implied is that the amount of cash that accrues from crops is almost the same as that used for re-buying the grains for consumption.

It was also said that from the annual sale of maize and millet the farmers earn Ksh. 1212 in total (if we do not take account of sales of other crops). At the same rates, the amount of crop which is purchased annually is worth Ksh. 762 if we are to go by the survey data. Jaetzold's(1982) or the Ministry of Agriculture's (1986) consumption figures which are already given could mean that the households purchase even more crop. But the survey data shows that in real terms, earnings, from maize and millet can be shown by the difference between Ksh. 1212 and Ksh. 762 which is Ksh. 450 annually.

Consumption as presented above almost cancels out sales so that earnings from the sale of crops is no longer meaningful because it is almost negligible. It is a transaction which almost lands the farmer in square one which is tantamount to producing no surplus worth considering. When we therefore bring in the cost of hiring labour against the almost neutralized crop earnings, we should get a clear picture of the inability of the small farmers to improve their lot and hence the gravity of 'meaningfully' accessible' agricultural finance to the farmers.

When we appreciate the above findings about levels of crop production and earnings within the framework of the findings about the factors discussed before this section and also incomes in fishing activities as will be presented, we should be able to answer the questions asked in Chapter 2: one, is the current farm organization able to retain labour in the agricultural sector especially in view of the production and income levels? and two, is the income differential between agricultural and fishing activities so pronounced as to occasion a drift of labour from agriculture to better paying sectors like fishing activities.

FACTORS AFFECTING PERFORMANCE IN FISHING ACTIVITIES

The findings presented above have established that there are a variety of factors that operate in the study area to lower farm production. One such critical factor is the engagement of part of the agricultural labour in fishing activities thereby creating a gap in agriculture which is never adequately bridged by earnings from fishing activities. The argument is therefore that part of such earnings should be invested in agriculture to correct the imbalance created. But the issue that arises is whether the incomes that accrue from the fishing activities are enough to enable those in this sector to make such remittance to agriculture.

However, before we present the incomes that are derived from the fishing activities, it is worthwhile to, first, briefly assess some of the issues that are obviously topical to the concern with labour expended on fishing activities and the incomes thereof. This is because these factors are interwoven in such a manner that over-concentration on labour and incomes alone would definitely be partial as to deny us the total picture of the real situation. These factors hence provide the necessary broad frame of reference within which one should, in earnest, appreciate the levels of income that those in fishing activities get. Some of the



factors that explain the performance and therefore incomes of those in fishing activities are hence presented in this section.

Equipment and Assets:

In appreciating the amount of labour in fishing activities and their incomes, cognizance should be taken of the finding that the majority of fishermen (94% in C3 type of households) use nets with the various associated methods like seine, etc. while 6% use lines. The most common equipment owned by the fishermen in their occupation are hence items like nets which are owned by 27% of the people, canoes which are owned by 13%, lines by 6%, pressure lamps by 15%. 39% of the fishermen did not own any equipment. These fishermen with no equipment are in fact part of those who are employed by others in the fishing activities. However there are some people employed in such activities who own one or two items such as nets and lamps. Whatever other item a fisherman may own, the canoe remains the most basic item. It is the ownership of the canoe which determines who actually controls the whole venture.

Among the fish traders in C3 households, 19% do not have any equipment. The rest own some form of assets or the other like stalls (64%), smoking equipment

(26%), drying equipment (22%), frying equipment (19%) and bicycles (21%).

The above situation shows that fishing in the study area is still confined to the shallow waters. The policy programme stated earlier of the intended "introduction of diesel engined and geared trawl boats to exploit the largely untapped off-shore fisheries resource" therefore still remain a dream not realized at the end of the plan period. The level of operation in the fishing activities as defined by the above equipment therefore mean that there is still room for improvement in this sector.

#### Marketing and Pricing:

Most of the fish that is caught in the study areas waters is sold in the local markets within Bondo and the neighbouring divisions. Only 41% of the fish finds its way to outside markets like Kisumu, Njoro, Nakuru, Nairobi and even Mombasa where they are sold in retail markets. Most fish dealers like selling in either these local or distant retail markets because they can get better returns by bargaining. Because of this, only 19% of the fishermen accept to sell to the refrigerated trucks that regularly come to the beaches to buy fish and

ferry to big hotels in the urban centres. Such traders normally buy from those who catch Nile Perch and purchase at a fixed price of Ksh 2 per kilogram of fish. Most of the fish traders argue they get fairer prices than this in retail markets.

It is however vital to note that there are some fish dealers who operate in the retail markets but buy the fish from the fishermen by weighing at the Fisheries stations at the beaches. Such people constitute 48% of the dealers. 42% price their fish by size, 39% price by fish type and 29% by the size of the container (mostly dagaa traders). Many people therefore price their fish by a combination of the above methods.

The findings above show that the catching and trading in fish in the study area are still mostly geared to serve local markets because most of the fish handled are not marketed through the Fisheries Co-operatives as will be seen shortly. The individual traders who handle the fish, given their level of operation defined by the assets they own, do not have the ability to explore and tap distant markets. This marketing situation has not made it possible to control the pricing of fish which is still determined by the trader's ability to bargain and the local demand and supply forces.

Fisheries Co-operatives:

The role of co-operatives in the performance of the those in fishing activities basically has to do with the purchase of the necessary equipment and assets by both bringing them closer to the members at fairer than market prices and offering them credit for such purchases. Co-operatives also undertake the marketing of fish and hence ensuring constant market at more stable and better prices given their ability to look for and bargain more effectively in such markets.

In the study area, people's participation in Fisheries Co-operatives is apparently very low if one is to make a judgement on the basis of membership figures. Despite the fact that 63% of those in fishing activities are aware of the existence of such co-operatives, only 7.5% are actually members. A number of reasons have been offered by those who are aware of the co-operatives' existence but have opted not to be members. 18% of them indicated that the co-operatives are not meant for the employed fishermen and traders while 21% felt that their operations were too small to warrant co-operative membership - an apparent allusion to the belief that co-operatives are meant for the wealthy operators. 55% of the operators have contended that they

do not understand or see the benefit of co-operative membership while 6% simply do not like them for no specific reason.

The low level of participation in the co-operative societies seems to be related to people's ignorance of either the existence of such co-operatives or the potential benefits that could accrue from their membership. Poor extension work, if any, among those in fishing activities could also partly explain this apathy. This is because nobody among those in such activities indicated any exposure to such extension services.

#### Credit Facilities:

The arrangements for credit facilities in fishing activities are almost a true replica of the reality in co-operative movement presented above, only worse. 37% of the people interviewed were not aware of the available sources of credit should they want to acquire finance for their operations. 54% of them are aware of the Fisheries co-operatives as sources of credit and 9% mentioned commercial banks. 5% and 1% of those who are aware have actually acquired credit from the two sources respectively leaving 94% of those who are aware outside the orbit of credit extension institutions. The 6% who have had credit

have only had it once. 20% of those who have had credit mortgaged their land, 20% mortgaged fish-related assets while the remaining 60% mortgaged other assets like buildings and so on. On average, Ksh. 2,700 has been borrowed by the above.

All the people who had had credit had acquired it solely to improve their fishing operations but in the end 40% had diverted it to non-fishing-related investments like improving their residential houses, paying school fees, etc.

Among those who had not made use of the credit facilities, 38% were afraid of defaulting and the resultant confiscation of the mortgaged collateral. 29% indicated that lack of collateral was the major impediment in their efforts to acquire loans. Other respondents (24%) did not have projects for which they would have wanted credit facilities while others (9%) stated that while they had made efforts to secure credit facilities, their efforts had been ignored by the credit institutions. This last group of respondents felt that failure to get credit facilities extended to them was due to 'red tape' which they cannot penetrate in such institutions.

The above situation shows clearly that there is still ample room for all round improvement of the organization of fishing activities to improve as well the end incomes. This still calls for efficacious policy measures and commitment in realization of the importance of fishing activities in terms of the implications they have for both the fishing industry itself as well as other sectors, especially agriculture.

LEVEL OF FISHING PRODUCTION AND INCOMES FROM FISHING ACTIVITIES:

After providing the above background of factors that explain performance in fishing activities, it is now time to assess the amount of fish that is harvested and handled and the incomes that accrue from such activities given the presented under-developed nature of the fishing operations. This section is basically a back-up for the argument for cash remittance from this sector to agricultural production activities.

Considering answers given by households categorized as C3, the average fish caught or handled per day by individual fishermen or fish traders is 25.4 kg. with 41% of these people dealing in 25 kg. or less of fish. 84% handle 50 kg. or less. Cash earnings from the

sale of 25.4kg. of fish is Ksh. 103 on average per day. This means that the cost of fish per kilogram is Ksh. 4.05 lumping all types of fish together. This price does not concur with the Department of Fisheries Price which fluctuates around Ksh. 2 per kilogram depending on the type of fish sold.

The above price difference is due to the fact that traders and fishermen sell at various levels using a variety of pricing systems, as already given, which offset any attempt to standardize the prices.

It should however be noted that the average daily income indicated above is gross and should therefore be appreciated against the average household fish consumption and the money used for equipment repair and replacement. The average daily fish consumption for every household is worth Ksh. 10.57 (which is 10.3% of the Ksh. 103 daily return from the fishing activities). This means that the surplus available for sale is worth Ksh. 92.43 (89.7%) per day or Ksh. 2772 per month. This figure should however be further corrected by the equipment repair and replacement factor which on average is Ksh. 393.3 per month and this hence leaves a net of Ksh. 2379.7 per month.



The above figures should also be viewed within the context of the fact that the bulk of the incomes from fishing activities goes to the 39% of those in these activities who own canoes and businesses and employ the rest. Such employers were said to claim at least 60% of the incomes leaving the 53% of those in these activities whom they employ with at most 40% of such incomes.

It was argued in the preceding section that in view of the under-developed nature of the organization of fishing activities, there is still room for improvement which can be associated with a rise in the level of incomes in this sector. This means that the incomes presented above can still be raised. But even at present levels, as has been pointed out earlier, these incomes are still above those derived from agricultural activities.

The purpose of the above section, as had been said, is to enable us to establish whether the incomes that are derived from the fishing activities can suffice to bridge the gap left in the agricultural sector by fishing activities. What needs to be asked now is the size of that gap so that we can see how comfortably the said incomes can offer a solution to this end. This is partly the purpose of the next section which will also

bring out the precise margin by which fishing activities actually influence agricultural production.

FISHING ACTIVITIES: SOME SPECIFIC IMPLICATIONS FOR AGRICULTURAL PRODUCTION

It is worthwhile concluding this chapter with a brief assessment of the exact magnitude of the impact of fishing activities on agricultural production by looking at the opportunity cost of the labour in fishing activities and un-remitted incomes thereof in terms of precise value in agricultural production. We are hence going to run through the above sections in this chapter picking items which can help to bring this out clearly.

It has been said that an average household has six persons with 3.94 acres of land. In C1 40.46% (1.59 acres) is cultivated while in C2 33.41% (1.3 acres) is tilled. The population figures showed that on average half of the people are children below 15 years of age and extrapolating this for households it means that only three of the six members are genuinely productive. Given the finding that on average C2 has 1.2 members in fishing, this means that while 3 people are shouldering the above farm work in C1, in C2 there are only 1.8 persons available to till the corresponding amount of land.

The average household yields for C1 is 3.64 bags of maize and 2.7 bags of millet and for C2 the figures are 1.96 bags of maize and 1.3 bags of millet. The average local sale price of the two crops per bag are Ksh. 193.8 and Ksh. 308 for maize and millet respectively. This means that C1 produces Ksh. 705.43 worth of maize and Ksh. 831.6 worth of millet annually on average. This, on the basis of the three productive members of the household, gives per capita production of Ksh. 235 and Ksh. 277.2 worth of maize and millet respectively. The logical implication is that in C2 where 1.2 members of the household are absent the production should be less than C1's total by a proportional margin, i.e. Ksh. 282 and Ksh. 332.64 worth of maize and millet respectively, or a total household production of Ksh. 423.43 worth of maize and Ksh. 498.96 worth of millet.

But the actual production among the households categorised as C2 was Ksh. 379.85 from maize and Ksh. 400.4 from millet. These give respective per capita figures of Ksh. 211 and Ksh. 222.4 from maize and millet. These figures show that C2's per capita production has fallen below the expected i.e apart from C2 households foregoing the expected per capita production of maize and millet for every member in fishing activities,

those household members remaining on the land also have their production decreased by a margin defined by the difference between the two corresponding sets of per capita figures or Ksh. 24 for maize and Ksh. 54.8 for millet per person. Even more simpler, we are saying that for every person that gets involved in fishing activities, the household foregoes on average 110.2% of the expected per capita production of maize and 119.76% of the expected per capita production of millet.

The proportion above the expected foregone (10.2% for maize and 1976% for millet) might verify the findings stated earlier that the labour that is drawn by fishing activities are by and large the men and the young who are presumably more productive than the average members of the households by the same margin. Alternatively it can point to the finding that women and children play a bigger role in farm production and they are presumably less productive than the average by the same margin as well.

The above computations have ignored hired labour's role given that the actual hours and days as well as the period interval during the season for which the same is hired were not adequately captured by the survey instrument. But it should be clear from the findings

about hired labour that if account of it was to be taken, then the effect would be to reduce the C2 production even further.

The income of those in fishing activities on average was said to be Ksh. 2379.7 per month after correction by consumption and equipment repair and replacement factors. This average is now going to be corrected by the latter alone because the former is included in the average household expenditure which was found to be Ksh. 1163.5 per month. The average monthly income hence becomes Ksh. 2696.7 if the distribution between the employers and employees as argued earlier is discounted. Since the monthly expenditure only constitutes 43.15% of their monthly incomes, they will have 56.85% of their earnings disposable. The amount foregone on the farm per person in fishing activities per month is only Ksh. 49.25 (1.8% of the average monthly income from fishing activities) given that the figures given about farm production above were per year (or the one season in the year).

The above means that these people in fishing activities can afford to discharge all their monthly expenditure obligations and bridge the gap they have left on the farm and still remain with 55% (Ksh. 1,483) of their incomes. This is assuming that these people

have only to exactly bridge the said gap and thereby keep farm practice and production at their current mode and level. But given the above ample room in their incomes, it means the people can afford, on top of improving their fishing activity operations, to improve as well their agricultural production activities beyond its present state and level.

The said 'ample room' is contended on the basis of the findings about the kind of equipment and assets these people have acquired for their operations as well as the evidence that most people indicated that they do not have any mortgageable asset aside from the land. It is therefore likely that this disposable balance of the incomes is not channelled to any profitable and viable investment and could therefore be used to boost operations in the two sectors. The question of what proportion is to be invested in what sector however remains a matter of further detailed research on the efficient and mutual operation of the two lines of activities.

SYNTHESIS:

It was argued in Chapter 1 that there are numerous factors which have been identified by many scholars to stifle agricultural production and many measures have been instituted in response to the operation of such factors in the study area and elsewhere. Despite such measures, farm production in the study area has remained low unlike in other places where similar measures have been tried. It was further argued that there must be a factor specific to the study area which was responsible for this state of affairs and this was postulated to be the fishing activities which draw labour from agricultural activities without compensation to the latter.

The study findings as presented in this chapter however established that while it is true that fishing activities have a bearing on farm production in the articulated manner, this factor does not offer full explanation to the low level of agricultural production in the study area. The survey found that the other factors identified by the previous scholars are still applicable to the study area and offer part of the explanation to low levels of farm production.

It was found that the incomes from the two sectors are both low considering the room that still exists

for possible improvement in both. But even at current income levels, given that agriculture is unable to lift itself from its own problems through the established channels, there is great potential in the fishing activities to improve both the two sectors. It is on the basis of the finding that the small farmers cannot make use of the available channels to improve their lot and that there exists such potential in fishing activities to improve both the fishing and agricultural sectors that recommendations at the end of this study are offered.



## CHAPTER FIVE

### CONCLUSION

#### SUMMARY AND CONCLUSIONS

The study findings have established very low levels of agricultural production in the study area : levels which fall far below expectation because of two main reasons. One, fishing activities have drawn agricultural labour from this area resulting in a significant fall in farm production and two, the organization of agricultural production activities within the study area is so poor that even if fishing labour was to be compensated for in the agricultural sector and the same farm organization maintained, the increase in the production would not even approximate the expected output. The above situation has meant that the incomes and hence living standards are considerably low given also the finding that the majority of the people largely derive their incomes from agriculture.

It therefore means that the bridging of the gap created by the labour diversion from agricultural production to fishing activities as well as the efficient and effective organization of the farm production activities in the study area still remain crucial as the ultimate determinants of rural welfare. But both the bridging of the said gap and the improvement of agricultural production organization are hinged on one overriding factor in the study area - finance.

The small farmers who are predominant in the study area have not been able to come by this finance to boost their farm production due to two reasons. Agricultural labour drawn by fishing activities and the resultant gap created has given rise to significant fall in farm production and therefore earnings. This means that households with more people in fishing activities produce less in their farms. The fact of fishing activities having a bearing on farm production principally rests on the finding that such activities draw the most productive labour from the farms. The small farmer, because of his relative financial inability initially, is unable to manipulate the available avenues to secure finance to improve his production the way the bigger farmers can. At the end of the day therefore, the small farmer needs money more than anything else to start his operations to surmount the two basic impediments.

If the small farmer is unable to make use of avenues open to him because he cannot raise his farm production to an extent which will give him such ability and reason to take advantage of the same, and he cannot raise his production until he has the finance, then it means that the small farmer is caught up in a pitfall out of which he can only be lifted by an initial offer of capital on 'soft' conditions. The government has therefore to consider selective agricultural

finance policy that favours the small farmer. This might entail procurement of foreign financing and/or mobilization of internal resources so that such finances can be used locally to usher the small farmer into the market economy where he can make use of the said openings.

It has also been found that the organization of fishing activities is not any better than that of agricultural production activities. This has entailed levels of fishing production and incomes that still leave ample room for improvement. But interestingly enough, it was established that the current level of income from fishing activities is still significantly above agricultural incomes. Consequently, incomes from fishing can be used to improve by a considerable margin both the sectors on top of bridging the said gap and providing subsistence requirements for the households.

Given, however, that even the income from fishing activities can still be improved, it means that the fishing sector has very great potential for improving itself as well as creating and sustaining the impetus for growth in the agricultural production activities. Agriculture, with its current low incomes

cannot improve itself. While therefore there is presently a conflict between the two sectors in the way fishing activities appear to have adverse effects upon agriculture, this can effectively be translated into mutual and harmonious relationship that can ensure coordinated and integrated development between them and therefore a better position for the households which have divided attention to both. This should, earnestly, be the crucial goal of development in this region. It is a development goal which recognizes correctly that agricultural production and fishing activities are necessarily related in the above manner and for as long as the households operate in the two sectors, activities in one sector cannot be divorced from the other - engagement in fishing activities explain performance in agricultural production activities.

To come up with any recommendation that should provide avenues to be followed in pursuit of this coordinated development, there is need to recap two major arguments which this study has advanced. It has been argued that agricultural production can only be given a facelift if the diverted labour can reinvest capital in the related activities. Also advanced is the contention that improved agricultural production cannot take off if the small farmers do not initially come by some form of finance that can thrust them beyond the 'self-perpetuating' subsistence economy.

This means that ultimately, it is this finance which is basic and which should constitute the point of departure in any attempt to make a turning point in the mode and level of agricultural production which means almost everything to the lives of the majority of small farmers in the study area.

But following from the argument in earlier chapters, Kenya cannot comfortably afford to foot the cost of giving the small farmers such a financial start which it is already suggested can only be done by decisive and expensive selective policies with regard to such cash. Kenya must therefore also assess its own local resource base and find out which resources it can harness to supplement the finances needed for such an investment. Kenya is lucky also to have one rich resource base in Lake Victoria for fish production and which activity has in the past constituted part of the occasion for low farm production and in whose tapping Kenya can also solve this past problem.

The above arguments are the premise upon which the following recommendations are offered : the search for this much needed finance. But following from the earlier argument about misapplied agricultural finances, there is necessitated a need for proper

guidance of the households in the investment of whatever finance becomes available. This definitely calls for agricultural finance going together with follow-up and guidance to ensure that any credit given to farmers is invested in profitable undertakings.

Because the study area has three categories of households, i.e. those households which have not been influenced by fishing activities (C1), those with some members undertaking fishing activities (C2) and the fishermen and fish traders themselves as households heads (C3) there is need to offer recommendations that address all the categories. It should however be noted that for this purposes, C2 and C3 households will combine because both are affected by fishing activities.

### RECOMMENDATIONS

Given the fact that different parts of Kenya have specifically different characteristics in terms of the circumstances which surround agricultural production, blanket policies that are coined around 'generally known' factors escape local practicalities that should constitute useful considerations and inputs into policy formulation and plan design. To formulate policies and design plans that are relevant

to the grassroots 'audience' and which can therefore not run the risk of failure, we must effectively consider these rural realities defined by the very local relationships in major economic activities that have a bearing on overall rural welfare - there are always links that can make a whole difference for a specific region with regard to the way they manipulate their local resources to eke a livelihood.

It is therefore recommended here that policy formulation and planning should be preceded with rational regional and local analyses to isolate these area - specific peculiarities defined by the said local relationships. This should mean that where there is no possibility of universal solutions being offered as the only remedies, there should be region - or area-specific policies and plans expressly addressed to such relationships as is the subject of this study. The essence of this recommendation is really selective government policies and investments to bring both regional and local balance.

The recognition of the above initial area and farmer differences and inequalities does not support the argument for 'equal opportunities and chances' in the use of some facilities. Giving people and

areas that initially have different starting points and exposed to different circumstances universally equal terms in the use of some facilities in the name of equal chances is actually giving them equal opportunities to become unequal in the end and thereby maintaining the status quo.

Following from the above recommendation of selectivity and given the central role of agricultural finance, the government should offer credit facilities on differential terms determined by the gravity of need. Universal terms of credit cannot augur well for the small farmers especially those in C1 households who have been trapped at the lowest ebb of circumstances. Meaningfully accessible credit to them means credit terms that take account of their special predicament so that such credit facilities are in the short run categorized with other Social Overhead Capital investments and not looked at in terms of Directly Productive Activities. This should be allowed to go on upto a point where the farmer is thrust to a level where he can acquire credit in normal terms. This recommendation recognizes the long term benefit of this pattern of investment.

The above means that a study should be commissioned to look into ways of structuring and efficiently operating



such a special credit system to determine who qualifies and at what point he quits this preferential treatment. The same study should look into ways of ensuring close cooperation between the farmer under such credit scheme and an extension agent or credit follow-up officer throughout the investment of this credit and the subsequent loan servicing. While this will ensure that the finance is usefully invested and that the loan recovery system is smooth, it will also develop gradually the ability of the same farmers to invest and manage such loans. But it was noted that the government is unable to lift the lot of such small farmers wholly through this means because of the exorbitant expenses involved. It therefore means that we must look into some local resources that the country can tap to supplement the above finances which the government can only get from foreign sources.

On the basis of the established linkage between fishing and agricultural production activities, it is recommended that a joint or comprehensive Agro-Fisheries Cooperative Society be started to handle the marketing of fish and agricultural products in this area as well as give credit for both fishing and agricultural production activities. This will help those in C2 households to firmly keep one leg in each sector. This means that the lake as a local resource

can be used for two purposes : one, to translate the old negative relationship the fishing activities has had on agriculture into mutual co-existence and two, to use the lake to generate supplementary finances to uplift the small farmer's production.

However the setting up of such a society should be done alongside a further study to work out the most viable mode of linkage by establishing how the cooperative could most effectively distribute the income to the various sectors and to work out reasonable benefit to the members for subsistence and other obligations. This is to say that there should be pre-defined proportions to go to various lines, e.g. what percentage of the incomes handled by the cooperatives should be retained and given at which times as material agricultural input or fishing equipment to members, what proportion goes to subsistence, equipment repair and replacement etc.

In fact apart from such a study just determining these proportions, its terms of reference should include researching into and recommending other ways of improving the organization of fishing activities to boost further the amounts of fish landed and hence disposable incomes. The study should also undertake a market survey to establish outside markets for fish

and also find out the consumption tendencies of both local and outside buyers in terms of what types of fish sells best where, at what times, in what amount and in what form.

Such a cooperative should be designed in such a way that it retains part of the old structure to avoid any sharp disruption which can occasion dissension. The employer-employee component in fishing can therefore be retained but both parties should be members of the same cooperative. This should call for the structuring of the income distribution by the cooperatives in proportions that are fair and which curb the exploitation of the employees as was found in the field. There is therefore need for the society to be given power to define categories of those operating in this sector in terms of employers, employees, traders, boat owners, net owners, lamp owners, etc. After defining these categories, the cooperatives should set fixed proportions of the incomes that is attached to each category. For example, if a boat owner is entitled to 30% of the sales, net owner to 12%, lamp owner to 4% and so on, it means that if one person owns both the boat and the lamp, he is entitled to 34% of the sales. In this way employees will also know their expected share of the income which they are to claim from the cooperatives. The definitions of these

proportions should be done according to the different fishing methods and associated equipment and employees all of which should be defined in the licences. In this way, both the distributional aspects of fishing incomes will be taken care of as well as the manner in which the same is invested.

Because the setting up of such an agro-fisheries cooperative will make redundant those who used to be fish traders in the old operational set up, those who wish to operate as traders should be engaged by the same cooperative for local sales and processing. This is suggested because apart from finding market outside the immediate locality, the local population must also be served and this requires an elaborate local retail network which should be managed by the same cooperative but manned by those cooperative members who operate as traders and enjoy the same benefits from the society as other fishing members. Such cooperatives are proposed to be formed for each division bordering the lake but affiliated to an umbrella agro-fisheries society which monitors and coordinates them all. However their operations in agriculture in terms of credit facilities should be operated in the same manner as the aforesaid special credit system with regard to follow-up and guidance of the farmers so that beneficiaries can invest in profitable activities.

It is also recommended that membership to such cooperatives be made mandatory so that licencing for fishing activities is conditional upon cooperative membership. This is in recognition of the low cooperative membership which was found in the field. **Mandatory** membership will mean that there will be need for more effective scouting of the waters and local markets to guard against poaching and black market selling so that only cooperative members fish and sell fish. This measure can also make it possible to set standardized prices for fish at levels that take into account the needs of both the producers and consumers. The cooperative ventures would also take over transportation and storage functions which would be undertaken more cheaply because the operators lobby behind the collectivity.

These recommendations are offered with the conviction that the government appreciates its obligation to institute measures to manage and tap the lake's resources in a manner that would be, first and foremost, beneficial to the focal region as well as its duty to be stern and firm if such measures are to be effectively implemented so that the resource base of Lake Victoria does not continue to be underutilized within its much moribund hinterland.

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APPENDIX I

HOUSEHOLD SURVEY QUESTIONNAIRE

- (i) Date of interview and time -----
- (ii) Name of interviewer -----
- (iii) Name of respondent -----
- (iv) Address of respondent -----  
Name of household head -----
- (v) Nearest Primary School or Centre -----
- (vi) Direction and distance from (v)(e.g 2km, NW) ----
- (vii) Sublocation and Location -----
- (viii) Name of sub-chief and chief -----
- (ix) Sample zone -----

Households' Questionnaire

1. Respondent's status (e.g. household head, wife, etc.)

-----

2. Household data (including respondent)

	Sex	Age	Primary Occupation	Secondary Occupation(s)	Education level & Any training
--	-----	-----	--------------------	-------------------------	--------------------------------

1. --- --- -----

2. --- --- -----

3. --- --- -----

4. --- --- -----

5. --- --- -----

6. --- --- -----

7. --- --- -----

8. --- --- -----

9. --- --- -----

10. --- --- -----

3. Detail out the type of work done by those in fishing activities in question 2.

No	Occupation
---	-----
---	-----
---	-----
---	-----
---	-----

4. Indicate the amount of money remitted home per day, week, month by each of the above (Q3) and where used/invested.

No	Amount (Kshs)	Where invested/used (indicate proportions)
-----	-----	-----
-----	-----	-----
-----	-----	-----
-----	-----	-----
-----	-----	-----

5. How many days per week/month does each of the above (Q4) devote to farm activities?

No. : 1            2            3            4            5  
Days :

6. Under whose name(s) is/are the household farm plot(s) registered? (eg. father, wife, son etc.)

	<u>Status</u>	<u>Size (acreage)</u>	<u>Proportion under cultivation now</u>	<u>Uncultivated part used for</u>
1.	-----	-----	-----	-----
2.	-----	-----	-----	-----
3.	-----	-----	-----	-----
4.	-----	-----	-----	-----

7. Accessibility and capacity of markets.

(i) Where do you sell your crops? -----

(ii) How do you transport it there? -----

(iii) How far is the nearest market centre to you?

(Name and distance in Km.) -----

(iv) How far is the nearest road to you? (name the road, and how far the respondent is off it, eg. Kisumu-Ugenge road - 0.5 km) -----

-----

(v) Is there any problem of lack of who to buy your produce or where to sell it at any time -----

If yes, which months of the year? -----

(vi) Type of road nearest to respondent (eg. all weather, seasonal, etc.) -----

8. Farm inputs:

(i) Which techniques and farm inputs (e.g. seeds, equipment, planting in lines, etc.) can you use if you want to improve your yield? -----  
-----  
-----

(ii) Which ones in (i) do you actually use on your farm?

- eg. - Improved seeds (specify) -----
- Fertilizers/manure (specify) -----
- Farm machinery (specify) -----
- Pesticides (specify) -----
- Irrigation (specify) -----
- Line cropping & spacing -----
- Consulting extension officer -----
- Any other (specify) -----

9. Agricultural extension officers' performance

(i) How many times have you been visited/served by an agricultural extension officer in the past.

- One week -----
- One month -----
- Two months -----
- Three months -----
- One year -----
- does not serve me at all -----

(ii) Briefly define the service given by the officer when he visits -----  
-----

10. Farmers' Cooperatives

(i) Which farmers' cooperative(s) exist(s) around you?  
-----  
-----

(ii) To which one(s) are you a member -----  
----- if none, why? -----  
-----

(iii) How do the cooperative(s) help its/their members?  
-----  
-----

(iv) What do you contribute to them and how regularly?  
-----  
-----

(v) What benefits have you got from the cooperative(s) /How have the cooperative(s) helped you? -----  
-----

11. Credit facilities and collateral.

(i) Which property/asset other than land do you have (eg. any investment, bank account, etc.)

-----  
-----

(ii) Which credit facilities (sources) are available to you in case you want to take some credit?

-----  
-----

(iii) Have you ever taken any credit? -----

-----

If yes, from which source(s)? -----

how many times? ----- over what period of

time? ----- where invested

----- if you have not

taken any credit, why? -----

-----

(iv) When was the last credit taken -----

was there any yield difference if invested in

agriculture -----

by what amount? (eg. debes, bags) -----

-----



(v) What did you mortgage to get your credit? -----  
-----

(vi) Can you mortgage your land to get credit improve it?  
----- if no, why? -----  
-----  
-----

12. Crops grown:

Crops grown	Seasons grown	Acreage	Yield in bags	Amount consumed	Cash earned	Cultivation method (specify eg. mixed cropping)
1.						
2.						
3.						
4.						
5.						

13. On top of your yearly agricultural production, do you have to buy any more crops for your household consumption? -----  
If yes, how much more do you buy per year (amount in bags/debes and cost in Kshs.) -----

14. Which members in Q2 actually work on the farm (eg. No. 1, 4, 8, etc.) -----  
On average, how many hours per day -----  
days per week ----- months per year -----  
do they put into farm work? -----

15. Do you hire any labour in any of your farm work? -----  
If yes, how many per season? -----  
at what cost per season (Kshs.) -----

16. Income and expenditure

(i) What are your sources of income?

Sources	Amount per day/week/month/season/year
- Farming	-----
- Business	-----
- Paid employment	-----
- Others (specify)	-----

(ii) Can you possibly estimate your income? )Kshs. per month, year, week, etc.) -----  
-----

(iii) On what items do you mainly spend your income?

Items (specify)	Approximate expenditure per day/week/month, etc.
1. -----	-----
2. -----	-----

- 3. -----
- 4. -----
- 5. -----
- 6. -----
- 7. -----
- 8. -----

17. (i) In your view, to what can you attribute your present level of agricultural production? -----  
-----

(ii) Is/are there any problem(s) you are experiencing now regarding your agricultural practice which you think might explain your level of production?  
-----

- If yes, which are they? 1. -----  
2. -----  
3. -----  
4. -----  
5. -----

(iii) Which solutions can you suggest for the above listed problem? 1. -----  
2. -----  
3. -----  
4. -----  
5. -----

APPENDIX II

FISHERMAN'S/FISH TRADER'S SURVEY QUESTIONNAIRE

\*\* FOR COUNTER-CHECKING \*\*

- (i) Date of interview and time -----
- (ii) Name of interviewer -----
- (iii) Name of respondent -----
- (iv) Address of respondent -----
- (v) Name of household head -----
- (vi) Nearest primary school or centre -----
- (vii) Direction and distance from (vi) (eg. 2km. NW) -----
- (viii) Sublocation and Location -----
- (ix) Name of Subchief & Chief -----
- (x) Sample zone -----

Fishermen's/Fish Trader's Questionnaire

- 1. Age ----- Sex ----- Years Worked -----
- 2. Education level/any training -----
- 3. Type of work/engagement/trade -----
- 4. Scale of operation (eg. owns business, canoe, stall,  
itinerant fish mongers, employed by someone, etc.) -----  
-----
- 5. If you are employed/own business, how many employees  
do you work with/have? -----  
-----  
-----

Data on employees:

No.	Age	Sex	Years Worked	Education level/ training
1.				
2.				
3.				
4.				
5.				

6. What type(s) of fish do you catch/deal in -----  
-----

7. What amount (weight in Kg. & Cost in Kshs.) do you  
catch/deal in per day, week, month, etc. on average?  
Kg. ----- Kshs. -----

8. How do you price your fish? (according to size,  
weight, type, size of container, etc.) -----

9. If you are a fisherman, what is/are your fishing  
method(s) and equipment used? -----  
-----  
-----

10. (i) If you are a fish trader, which assets and equipment do you have in your establishment (e.g. stall, shop, drying and smoking equipment, etc.) -----

(ii) In what form do you buy and sell your fish? (eg. fresh, dried, smoked, fillets, etc.) -----  
-----

(iii) If sold dried, smoked, etc. do you do that yourself?  
----- if no, who does it? -----

11. How has the catch/availability of fish fluctuated throughout the year 1986/87 (in terms of weight, cost of the fish you catch/deal in per day/week/month)?

January ----- February ----- March -----  
April ----- May ----- June ----- July -----  
August ----- September ----- October -----  
November ----- December -----

How much money do you use for equipment repair/  
replacement, etc. per year (Kshs.) -----

12. What amount of fish do you take from your catch/business for your household consumption per day/week/month -----  
Kshs.) ----- What amount do you sell per day/week/  
months (Kshs. -----

13. Do you own any piece of land at home? -----  
 If yes, what size (acres) ----- what portion  
 of it in acres is tilled ----- who actually  
 works the farm? -----  
 -----

14. How many days per week/month do you take off your  
 fishing engagement to attend to your farm work? -----  
 -----  
 -----

15. Crops grown:

Crops grown	Seasons grown	Acreage	Yield in bags	Amount consumed	Amount sold	Cash earned (sh)	Cultivation method (specify eg. mixed cropping)
1.							
2.							
3.							
4.							
5.							

16. What is the size of your household? -----

17. How much money from your fishing engagement do you  
 use to supplement your household subsistence per day/  
 week in Kshs. -----

18. Do you use any money from your agricultural earnings to invest in your fishing activities? ----- if yes, how much (Kshs.) -----

19. Do you use/invest any money you get from your fishing/fish trade in agriculture/farm activities? ----- if yes, how much per year (Kshs.) -----

20. Which cooperative society related to your occupation operates nearest to you which you can join -----  
-----  
-----

21. Are you a member of any cooperative society? ----- if yes, which one -----  
if no, why -----  
-----

22. In what ways can/does cooperative membership benefit you? -----  
-----

23. What are the sources of credit available to you in your line of engagement -----  
-----  
-----



24. Have you ever got any credit from any source? -----

If yes, which source -----

If no, why? -----

-----

If yes, how many times ----- over what period of

time? ----- how much in total? -----

where invested -----

-----

when was the last credit taken -----

26. What did you mortgage to get your credit -----

-----

-----

-----