

EAST AFRICANA COLLECTION

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**THE BAMAKO INITIATIVE AND ITS RELEVANCE TO  
MALARIA CONTROL IN BAR CHANDO SUB-LOCATION,  
BONDO DIVISION, SIAYA DISTRICT, KENYA**

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BY  
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**A THESIS SUBMITTED TO THE INSTITUTE OF AFRICAN STUDIES IN  
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD  
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THE UNIVERSITY OF NAIROBI**



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DECLARATION

**This thesis is my original work and has not been submitted for a degree to any other University**

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## DEDICATION

**To my Father, the Late Ezekiel Mulemi Munyasa, and  
my Loving Mother Mrs. Mary Nyagoha Mulemi**

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## ABSTRACT

This study attempted to examine the relevance of the Bamako Initiative (B.I.) approach to malaria control in Bar Chando sub-location, Bondo division. The general objective of the study was to describe the differences in knowledge, perceptions and the use of the B.I. services among men and women. Specifically, the study set out to determine the perceived socio-economic costs and benefits which influenced the use of the malaria control services. It also aimed at describing the people's perceptions of the risks and control of malaria as well as the current ethnomedical malaria control practices employed.

Standardized questionnaires with both open-and closed-ended questions were used in data collection. More data were acquired through unstructured interviews and direct non-participant observation. The data were analyzed through qualitative and quantitative techniques which included inferences from verbatim reports, simple frequencies and cross-tabulations. Interpretations were based on the ecological theory and the health belief model.

The findings indicated that there were no major differences between men and women regarding their knowledge, perceptions and use of the B.I. services. However, very few people used the B.I. services and instead relied more on local shops and other sources of medical care. The major reason for the under-utilization of the B.I. services, especially bednets, was the local people's low income. Also a majority of the people did not have confidence in the services provided by volunteer community health workers (CHWs) as well as the fact that there were no referral systems and specialist supervision to support the B.I. malaria control efforts. The study also revealed that the

local people were more likely to depend on the widely available traditional malaria control resources. The study population generally had a high knowledge of the risks of malaria but they lacked a complete grasp of how malaria is caused and transmitted.

It is recommended here that feasible income-generating projects be set up to help in sustaining the B.I. programme. Locally acceptable ways, such as the merry-go-round and hire purchase arrangements, should be encouraged to help the poor pay for the health services more easily. There should be increased malaria control education activities as well as awareness campaigns about the B.I. services. It might also be helpful to train the CHWs in the management of malaria and other diseases. The efforts should be supported by a referral system and regular supervision. Finally, scientific studies should be carried out on the efficacy of the traditional malaria medicines and mosquito repellents. If some of the traditional remedies are found to be efficient, they should be made available to the local people.

## CHAPTER ONE

### INTRODUCTION

#### 1.1.0 The Bamako Initiative

The Bamako Initiative (B.I.) is a regional community-based health care strategy for Africa. It was endorsed in Bamako, Mali, in 1987 by African Ministers of Health at a meeting of the regional committee of the World Health Organisation; the regional office for Africa (WHO/AFRO). The resolutions of this initiative were based on four already existing policies:

- i. Health for all by the year 2000;
- ii. The district level strengthening of health systems;
- iii. Health as a basis for development; and
- iv. 1988 as the year of protection, survival and development of African children (UNICEF 1990:3).

The Bamako Initiative aims at sustaining broad-based activities for strengthening primary health care (PHC). The basic aim of the initiative is to reinforce PHC at the district level, including the rehabilitation of health services at the periphery of the districts. Therefore, decentralization, sustainability and local participation are some of the basic concepts of the B.I. In 1988, there was more elaboration on the implementation of the guidelines that were approved by the WHO/AFRO regional committee. According to UNICEF (1990:4), the B.I. encapsulates the following principles:

- i. National commitment to accelerating the provision of universally accessible PHC services;
- ii. Substantial decentralization to the district level of the ministry's decision-making for the management of PHC;
- iii. Decentralized management of community resources, thereby allowing the funds collected at the local facilities to remain under the community's control;
- iv. The application of consistent principles governing community financing for health care services throughout the different levels of the health system;
- v. Substantial government financial support for PHC to ensure that the health budget

- is maintained, at least to its current level of support to district local services;
- vi. Policies of essential drugs that are compatible and complementary to rational development of PHC;
- vii. Measures for ensuring that the poorest people have access to PHC services; and
- viii. The clear definition of intermediate health system and management of objectives and the establishment of indicators to measure them.

The above guidelines for the Implementation of B.I, as they were adopted in Bamako were found to apply for the Kenyan situation (Boer den 1992: 15)

### **1.1.1 The Bamako initiative and Malaria Control in Kenya**

Malaria control efforts were affiliated to the B.I. in Kisumu District in late 1989 and later expanded to South Nyanza, Kwale and Baringo districts (UNICEF 1991a; McPake et al. 1991; Boer den 1992). It is hoped that following the successful operation of the initiative in the selected districts, it will also be replicated in the other parts of the country. There have also been trials of the initiative in other areas such as Usigu and Bondo divisions, both in Siaya district. The programme involves the training of Voluntary Community Health Workers (CHWs) and the establishment of Village Health Committees (VHC). Although there are also treatment components in its programmes, the interest of the B.I. in malaria is mainly focused on control and prevention measures. The CHWs administer drugs and motivate people to use the cheaply available insecticide impregnated bednets. They also monitor the prevalence and incidence of malaria during programme implementation. This is in line with the strategy which is aimed at improved diagnosis and treatment. On the other hand, the B.I. involves the establishment of community pharmacies, bednet dipping and re-dipping in insecticides and the giving of health education. Also, environmental management, which includes measures to control mosquito breeding, is part of the B.I. activities. The Bamako Initiative, on the other hand,

was designed to involve the community in planning, target setting, implementation and evaluation of health programmes. To suit the Kenyan situation, the following three broad objectives were adopted for the local implementation of the B.I: (UNICEF 1990b).

1. Strengthening and extending the CHW network to cover the key curative and preventive health needs of the population.
2. Supporting community organizations in action, in promoting and sustaining health care development particularly community run pharmacies which allow for immediate access to basic essential drugs.
3. Supporting the rural health system of health centres and dispensaries, particularly in maternal and child health and in supervising the CHW network.

The main aim of the malaria component of the B.I. is to reduce illnesses and deaths caused by the disease. The general objective of the B.I. is to reduce infant, child and maternal mortality and morbidity through improving the accessibility, utilisation and the quality of maternal and child health at the grassroots level.

### **1.1.2 Implementation of the Bamako Initiative in Bondo Division**

There have been various organizations involved in the implementation of some of the B.I. principles through PHC programmes in Bondo division. These include the following:

- a. Maseno West Diocese of the Church Province of Kenya (CPK);
- b. International Food and Agricultural Development (IFAD);
- c. CARE-Kenya;
- d. Kenya Freedom Hunger Council for National Development.

Before the implementation of the B.I., CHWs are recruited and trained for at least two weeks. After this training, they are each given an anti-malaria drug kit and instructed to sell the drugs to members of the community. The proceeds from the drugs and bednet sales are expected to create a revolving fund which can, in turn, be used to purchase

more drugs. The CHWs are chosen on the basis of the traditional nyamrerwa (plural, nyamreche) system which literally translates to a "traditional birth attendant (TBA)". The monitoring and management of the B.I. services is done by the Village Health Committee (VHC) which is male dominated, with only one female member unlike CHWs who are entirely women.

Presently, there is only one area in the whole of Bondo division where the B.I. has been introduced and is expected to be operating. The initiative is only found in Bar Chando sub-location, North Sakwa location where it was launched in August 1993. However, preparations for the initiative are also currently being made in other areas, including Abom and K'Apiyo sub-locations and East Migwena location (Map 5). Today, the VHC in Bar Chando consists of 22 members, 17 of whom represent the eighteen major clans in the sub-location, while 5 other committee members were chosen from the major church denominations in the area. Thirty CHWs were chosen, with at least one coming from each major clan village (Map 4). However, at least three CHWs have dropped out since the B.I. was started in Bar Chando sub-location yet the initiative is highly dependent on the performance of CHWs.

The selection for one to be a CHW is on a voluntary basis and, thus, the present CHWs do not work for payments. As a minimum requirement, each CHW is expected to know how to read and write in Kiswahili, Dholuo or both, although those who have a basic knowledge of English are preferred. The health workers are also expected to be permanent residents of Bar Chando sub-location.

Each clan village is represented in the VHC by an uguru, or village elder, through whom complaints, such as the loss of drugs are reported to the area Assistant Chief.

Before the creation of the B.I. in Bar Chando sub-location, community sensitization was done in churches as well as during the sub-location weekly gatherings commonly known as baraza. The formation of the VHC was done after various announcements of the intention to recruit clan representatives.

The B.I. administration consists of a chairman, treasurer, assistant treasurer and secretary. There is one divisional co-ordinator who oversees the B.I. activities in the whole of Bondo Division. The community pharmacy serves as a depot for drugs and mosquito nets which are sold to the local people by CHWs. The essential drugs kept in the pharmacy and the CHW kit include the following drugs:

- a. Panadol;
- b. Magnicient trisilicate;
- c. Chloroquine;
- d. Benzyl Benzoate emulsion;
- e. Ferrous sulphate (folic acid);
- f. Tetracycline eye ointment; and
- g. Piperazine

The initial sponsorship for the Bar Chando B.I. programme was from a non-governmental organization known as Community Initiatives Support Services (CISS) which is based in Kisumu town. This organization offered the first supply of drugs and bednets. It was expected that these medical and bednet supplies would later on enable the community to buy its own stock as stated in the UNICEF policy (B.I. co-ordinator, personal communication).

There are two models in the implementation of the B.I. First, there is the model of improving the quality of existing health facilities as is the case in Guinea, Burundi and Uganda. Second, there is the provision of basic services to unserved communities as in Kenya and Nigeria (Boer den 1992: 29). The B.I. programme in Bar Chando sub-

location has a very superficial link with the divisional and district health facilities and typically fit in the second model of implementation. The community pharmacy for the Bar Chando B.I. programme, was set up on the basis of two criteria. These included remoteness, that is, it was set up in an area that was perceived as being far away from dispensaries, health centres and the district hospital. The availability of storage room on a private farm was also a determinant of the location of the pharmacy. The pharmacy is the B.I. centre for replenishing the CHWs' drug kits, selling bednets as well as dipping and re-dipping of the nets. Drugs are, however, not sold directly at the community pharmacy. The CHWs keep the drugs in their homes from where people who need them can buy them. The CHWs dispense drugs and ideally they are expected to refer the difficult cases to the nearest health centre or dispensary, however, they rarely do. The CHWs also engage in community health education, especially, in such areas as sanitation, hygiene, child care and malaria control.

### **1.2.0 Malaria**

Malaria is an environmental problem that has afflicted humankind for ages. For instance, as early as the 4th Century BC, it was being described by Hippocrates and it is, therefore, one of the most ancient diseases (Harrison 1978: 1). The term malaria derives from the Latin word "malaria" or bad air, denoting that the disease was associated with stagnant water, marshes, mud and newly ploughed land which contain decaying organic matter. Coincidentally, mosquitoes that carry the malaria parasite can breed in stagnant water and environments with decaying organic matter (Harrison 1978: WHO 1987). Repeated malaria infections often retard child development and also lead to the loss of productive activity among adults. It is endemic in the tropics and in sub-



Saharan Africa where it is the commonest cause of death among both adults and children. The disease is transmitted to human beings by female mosquitoes of the genus *Anopheles*. Malaria is caused by minute parasites which infect both their human and insect hosts (Knell 1991; Young and Duston 1987; Nyamwaya and Akuma 1986). The malaria parasites are only spread from one person to another by mosquitoes. This implies that if mosquitoes were somehow to be eradicated, malaria would also be eradicated. The parasite attacks the human red blood cells and prevents the flow of oxygen to body tissue and cells. This results in chills, high fever, headaches, nausea and sometimes, deaths. In human beings, malaria parasites multiply first in the liver and from there they enter the red blood cells. Other mosquitoes are infected by biting the sick person and this continues the cycle of infection.

There are four types of malaria and these include *falciparum*, *vivax*, *ovale* and *malariae malaria*. The most dangerous of these types is *falciparum* malaria which is also found in the study area (American Association for the Advance of Science 1991; UNICEF 1991c) and virtually all serious cases and deaths from malaria are attributed to it. Similarly, most cases of miscarriage, low birth weight, still-birth and death of non-immune pregnant women are attributed to *falciparum* malaria. The disease is, therefore, a huge economic liability through reduced productivity, the enormous amounts of money spent in fighting it and, ultimately, the fatalities.

The primary method of malaria control is mosquito control. This involves draining or spraying pools of stagnant water where the mosquitoes breed. The use of insecticides and bednets is also important in preventing infection. People also make use of over-the-counter anti-malaria drugs which have proved to be effective in checking the disease.

Drugs such as Homaquin, Malaraquin and Dawaquin, among others, are important in supplementing hospital and dispensary efforts. In many countries, malaria control has been wholly or partially incorporated into the national public health establishments. However, most programmes have neglected the social, cultural and ecological conditions of the affected communities. The global strategy for malaria control aims at the reduction of mortality, morbidity as well as the social and economic losses caused by this disease.

According to the World Health Organization. (WHO 1992: IV), there are four elements in this global strategy:

- i. to provide early diagnosis and prompt treatment;
- ii. to plan and implement selective and preventive measures;
- iii. to detect early, control and prevent epidemics;
- iv. to reassess a country's malaria situation, in particular the ecological, social and economic determinants of the disease.

WHO, therefore, recognizes the need to initiate a wide range of flexible community-based efforts such as the B.I. to control malaria.

### **1.3.0 PROBLEM STATEMENT**

Malaria is a complex social and health problem since it is the commonest cause of morbidity and mortality among both adults and children. Although several projects and programmes have been put in place to control the disease, it continues to be a threat to public health.

The Bamako Initiative (B.I.) is a new approach to primary health care (PHC) and has a malaria control component in it. In late 1989, the malaria control activities were incorporated in the B.I. programme in Kenya, with a pilot project in Kisumu district (UNICEF 1991a). The aim of the programme was to reduce illness and death due to malaria for those most at risk, particularly young children and pregnant mothers. The

main malaria control strategies of the B.I. include, improved diagnosis and treatment, individual protection through the use of insecticide-impregnated bednets, health education and environmental management. Other activities are, community health worker's distribution and regular reimpregnation of the nets from community pharmacies, setting up of village health committees and sell of Chloroquine. All these B.I. activities and services are supposed to rely on various mechanisms of community financing.

Bondo division, which is a malaria holoendemic area, has been served by malaria control programmes carried out under the rubric of P.H.C. In Bar Chando sub-location, the B.I. approach was launched in August 1993. This coincided with phase three of the national implementation period of 1990-1993. In this phase, the B.I. was planned to be implemented in Kisii, Kericho, Siaya, Nandi, Nakuru and Kilifi districts (UNICEF 1990b).

The take-off of the B.I. toward sustainability in Bar Chando sub-location is yet to be realized. Even after the two years of operation, the local people's knowledge and utilisation of the Initiative's malaria control services is minimal. This study, therefore, aimed at investigating and assessing the relevance of the B.I. approach to malaria control in Bar Chando sub-location. The study addressed the question of how the local socio-cultural and ecological conditions influenced community participation in the programme's malaria control activities as well as the people's use of the services provided. In this regard, this study set out to explore the viability of the B.I. in terms of how well it met the local cultural beliefs and knowledge or concepts about the prevention and control of malaria.

Reports about the B.I. indicate that its guidelines for implementation are applicable to the Kenyan situation (Boer den 1992; Mcpake et al. 1991; UNICEF 1990

b; 1991a. c). However, little is said about the appropriateness of the B.I. approach to malaria control in rural communities. Therefore, the question as to whether the B.I. was contributing directly and significantly to malaria control in Bar Chando sub-location was addressed. This study also explored issues related to acceptability, affordability and general appropriateness of the B.I. malaria control methods, instruments and services in the context of the Luo Bar Chando community. In this regard, this thesis examines the B.I. approach in terms of how well it responds to the local community needs and concerns related to malaria control.

The factors influencing local participation in the B.I. activities related to malaria control were identified. The use and non-use of the Initiative's services in Bar Chando sub-location were studied and analysed with the aim of answering the following main research questions:

1. What are the perceived socio-economic costs and benefits that affect the use of the Bamako Initiative services?
2. What are the perceptions and attitudes of men and women towards malaria control activities?
3. To what extent do men and women draw from traditional methods of prevention and treatment of malaria?
4. How does accessibility to the other health facilities and services affect the use of the Bamako Initiative's malaria control services?

## **1.4.0. OBJECTIVES**

### **1.4.1. General Objective**

To describe the gender differences in knowledge, perceptions and utilisation of the Bamako Initiative malaria control services among men and women of Bar Chando sub-location.

### **1.4.2. Specific Objectives**

Specifically, this study set out to meet the following objectives:

1. To determine the perceived socio-economic costs and benefits that motivate or discourage the use of malaria control services.
2. To describe the perceptions of malaria risks and control among men and women
3. To describe the ethnomedical practices that co-exist with modern malaria prevention and treatment practices.
4. On the basis of the research findings to offer suggestions on how to make the B. I. an effective community-based malaria control programme to the local population in an environment where other sources of treatment and prevention of malaria exist.

## **1.5.0 JUSTIFICATION OF THE STUDY**

Malaria eradication programmes based on biomedical principles alone are bound to fail. The biomedical paradigms do not always take into consideration the cultural, social and psychological factors which might either enhance or restrict malaria control efforts. It is, therefore, imperative for social scientists to engage in research associated with the importance of human behaviour in malaria control (Gomes and Litsios 1993: 1091). This study will facilitate the establishment of strategies that would motivate popular participation in desired malaria control activities. Community participation is particularly crucial in Africa where malaria continues to have serious demographic

implications such as high deaths and disability rates.

The objectives of this study are relevant to the World Health Organization (1978) declaration of "Health for All by the year 2000". One of the basic principles of primary health care (PHC) supported by the declaration was that:

Essential (health) care is to be made universally accessible to individuals and families in the community by means acceptable to them through their full participation and at a cost that the community and the country can afford (Najera 1986: 301).

Therefore, a research which is focused on gender differences in the uptake of malaria control measures would offer information on the social, cultural and environmental factors to be considered. This study provides data for the assessment of the impact of the Bamako Initiative as a specific health intervention strategy in a rural setting. Local needs and preferences in malaria control can be elicited from the data on knowledge, perceptions and utilisation of the health intervention aimed at the participation of adult community members. This study also contributes data on the community perceptions of malaria causality and control services, as this is crucial in the design of educational messages and policy for the Bamako Initiative. This is because conflicting perceptions have an important effect upon operations and effectiveness of a malaria control programme (Gomes and Litsios 1993).

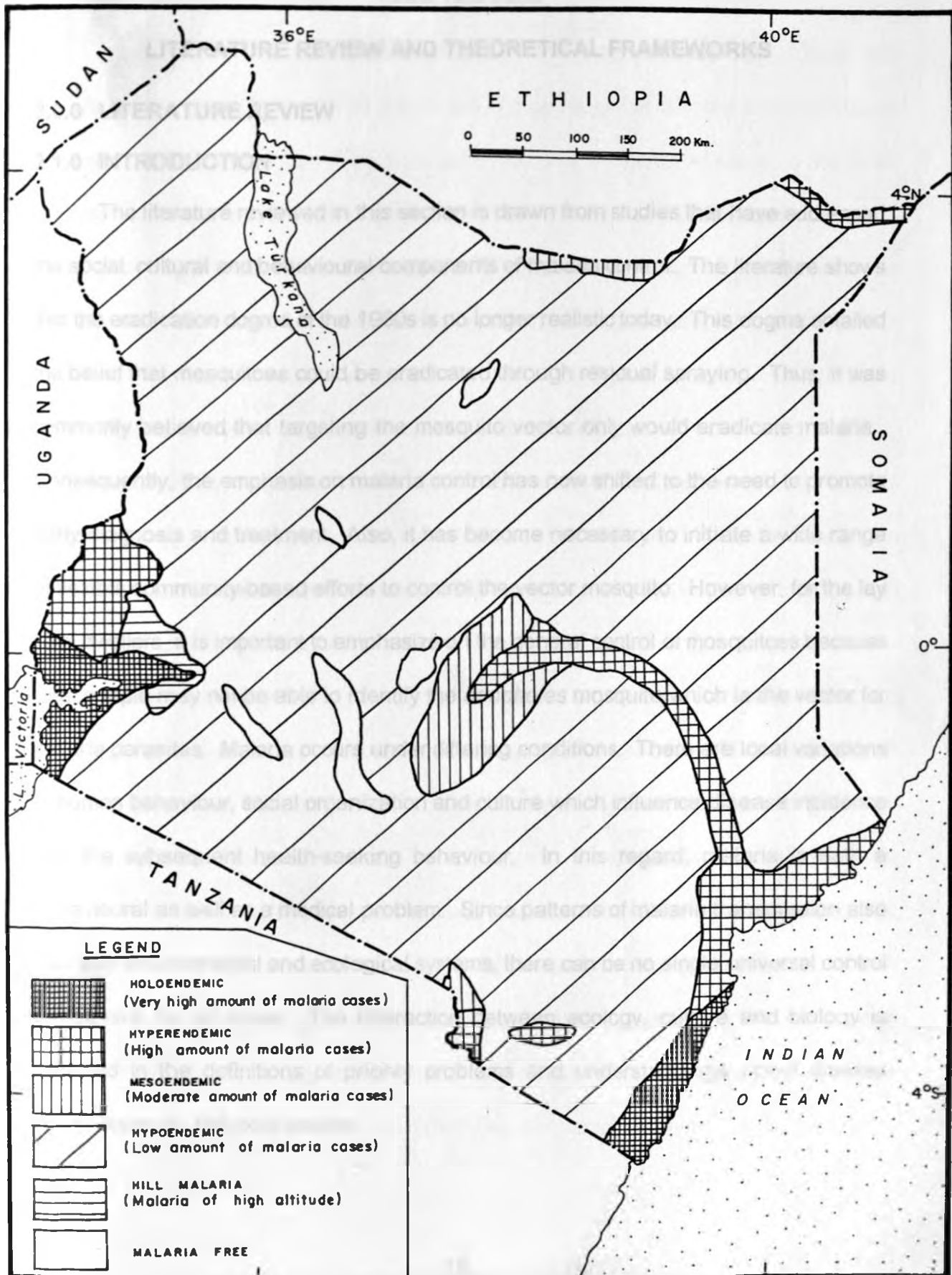
Additionally, the objectives of this research are highly relevant to the principles of the Bamako Initiative. At the inception of this initiative, community mobilization was recognized as a fundamental requirement for PHC. According to UNICEF (1990: 6), the nature of community involvement in the Bamako Initiative varies from country to country, depending on whether the local communities have a history of participation in development efforts or not. This study provides some basic data to be used in designing

educational messages to improve community participation in the use of health intervention services. Also, the present study would enable the health intervention policy makers to realise the local specific needs in malaria control programmes. Community education in malaria control can be enhanced by the understanding of gender differentials in the perception and use of the Bamako Initiative malaria control services.

① It is also hoped that the study would contribute data on the reasons for the non-utilisation of PHC. The research similarly provides some responses to the Bamako Initiative's call for operational research which is an increasingly important component of the Initiative (UNICEF 1990:7; Boer den 1992:20).② In the same vein, the research findings of this study can be used to improve the technical and quality of work being carried out in malaria control. For example, a collection of the names of plants used in the treatment of malaria is a boost to local studies on new drugs independent of those done in other countries.③ Above all, research on the behavioural aspects in the use of the Bamako Initiative is necessary. The information acquired is useful in expanding the malaria control component of the B.I. to the other affected areas in Kenya. (Map 1).

In conclusion, malaria continues to be a serious threat to human life despite the past efforts to curb it. This study, therefore, examines an existing Bamako Initiative malaria control programme so that it can be seen in its context. The findings of this thesis would be a significant contribution to the literature on community-based control of malaria in Kenya. Thus, the data in this study would help in enhancing the Bamako Initiative which is a new approach to PHC and malaria control in Africa.





Map1. Kenya: Endemicity of Malaria

Source: DVBD Annual Report, 1983



## CHAPTER TWO

### LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

#### 2.0.0 LITERATURE REVIEW

##### 2.1.0 INTRODUCTION

The literature reviewed in this section is drawn from studies that have addressed the social, cultural and behavioural components of malaria control. The literature shows that the eradication dogma of the 1960s is no longer realistic today. This dogma entailed the belief that mosquitoes could be eradicated through residual spraying. Thus, it was commonly believed that targeting the mosquito vector only would eradicate malaria. Consequently, the emphasis on malaria control has now shifted to the need to promote early diagnosis and treatment. Also, it has become necessary to initiate a wide range of flexible community-based efforts to control the vector mosquito. However, for the lay rural dwellers, it is important to emphasize on the general control of mosquitoes because rural people may not be able to identify the *anopheles* mosquito which is the vector for malaria parasites. Malaria occurs under differing conditions. There are local variations in human behaviour, social organization and culture which influence disease incidence and the subsequent health-seeking behaviour. In this regard, malaria is both a behavioural as well as a medical problem. Since patterns of malaria transmission also vary with environmental and ecological systems, there can be no single universal control programme for all areas. The interaction between ecology, culture and biology is reflected in the definitions of priority problems and understandings about disease transmission by the local people.

### 2.1.1. The malaria problem

Malaria is a major public health problem in the world (Ojiambo 1986; Young and Duston 1987; Knell 1991). Of all the parasites that cause the disease in the tropics, a species called *Plasmodium falciparum* which causes *falciparum* malaria, is the most dangerous. According to Gomes and Litsios (1993: 1091), malaria causes considerable pain, suffering and death to an estimated 270 million people world wide. The burden is most severe in Africa where approximately one million deaths are estimated to result from this disease, primarily amongst children below the age of 5 years. The direct and indirect costs of malaria are enormous in sub Sahara Africa.

Malaria may bestow immunity after several attacks. However, in its initial stages, it drains energy and undermines the health of those who survive its miseries. Apart from the vast sums of money used annually in the health care of the victims of malaria, the loss of productivity and the rate of poverty in developing countries largely contributes to the prevalence of the disease. Initial malaria control efforts were transformed into the desire for total eradication. This followed the successful use of the DDT insecticide at the beginning of the Second World War. Residual spraying using the insecticide showed the potential for perfect control and the eradication of the malaria scourge (Harrison 1978; Knell 1991). Indeed, eradication was realized in countries such as Venezuela, Greece, Guyana, Sri Lanka and the USA. The insecticide was found to be practical, less toxic to human beings, cheap and simple to use. Therefore, the adoption of the concept of malaria eradication in a global anti-malaria campaign was encouraged. However, the DDT spraying process in some countries was not smooth due to negative attitudes toward the insecticide.

The global campaign soon encountered obstacles. For instance, in the late 1960s and 1970s, there was a sharp deterioration in the global malaria situation. The failure of the eradication campaign was blamed on the following factors:

- i. the abandonment of antimalaria control efforts;
- ii. the diminished frequency of the disease in some areas;
- iii. the transfer of control to general health services which were ill-equipped for the task;
- iv. Lack of funds and skilled personnel; and
- v. "technical obstacles" such as mosquito resistance to insecticides, parasite resistance to drugs, human population movements and inaccessibility of certain population groups (WHO 1987: 22).

However, nothing was said about the knowledge and perceptions of people towards such control efforts in different ecological and cultural settings. It was not understood that malaria control efforts could be hindered by behavioural responses.

With the recurrence of the disease in the late 1960s, global scientific interest shifted from the call for eradication to that of control efforts (Harrison 1978; WHO 1987).

According to Harrison (1978: 258), to accept control meant to accept malaria as a continuing incubus and aim only at mitigating the burden, that is, reducing the incidence of the disease.

The same threat of resurgent malaria is still recognized today. This implies that efforts should be made to ensure that control principles and practices are presented in a way that is acceptable to local populations in different areas of the world. Therefore, in 1992 the World Health Organization brought together health officials and policy makers from 107 countries in Amsterdam to adopt a global malaria control strategy. Advocacy for malaria control rather than eradication encourages the mobilization of local resources to fight the mosquito. Similarly, other malaria control activities indicate that

human beings should learn to live with the mosquito, but avoid its effects. This view tallies with Harrison's (1978) observation that there is a need to accept the enemy, that is, the mosquito. Mobilization of resources include the human being who should be made to accept and understand the relevance of any control effort. Studies indicate that the factors that led to the failure of malaria eradication in the 1960s may still be responsible for the little success in current control strategies. This is because malaria remains a serious health problem since the failure of the global eradication campaign (Lipowsky et al. 1992). It must also be emphasized that the eradication campaign had a negligible impact on sub-Saharan Africa (Harrison 1978). Since the inception of malaria control strategies, little attention has been paid to the specific social, behavioural and cultural factors. The literature indicates that research and other efforts have been directed towards the biological features of the malaria parasite. Vast human and financial resources have been invested in the production of cures and vaccines as well as diagnostic techniques. Little has been done on the human behaviour affecting malaria control (Gomes and Litsios 1993).

### **2.1.2 Problems of Malaria Control in Africa**

According to Steketee et al. (1994), much of the malaria morbidity rates among children in sub-Saharan Africa occur in rural areas. Malaria has also been described as a rural disease because its burden is least felt in the urban areas. In the rural areas, access to diagnostic technology is limited. As a consequence, malaria control strategies must emphasize the empirical treatment using the right dosages which are active against the malaria parasites. This can be attributed to priority and lack of relevant knowledge among some health workers and the local populations.

Malaria control in Africa is hindered by the existence of a variety of malaria transmitting mosquitoes. Six species of the *Anopheles gambiae* mosquitoes are effective vectors of human malaria in Africa and other tropical regions (Knell 1991). A species called *Anopheles pharoensis* is found in many geographical and ecological conditions. This species is effective in malaria transmission even in the absence of the female anopheles mosquitoes which are the main malaria vectors. The control of malaria transmission has also been impossible due to the resistance of mosquitoes to cheaply acquired insecticides such as the DDT (Roberts 1974; Harrison 1978; Ojiambo 1986; WHO 1987; Knell 1991). In Kenya, the resistance of the *Anopheles* mosquitoes to insecticides has been confirmed in Kisumu, Mwea-Tabere and Malindi Districts (Roberts 1974).

In sub-Saharan Africa, the treatment and prevention of malaria has been made more difficult by the resistance of the parasites to chloroquine (Campbell 1991; Ojiambo 1986; Winch et al. 1994; Steketee et al. 1994; Knell 1991). Since chloroquine is the most inexpensive and widely available antimalaria drug, the resistance of the parasites to it is a big blow to poverty-stricken countries. A chloroquine-resistant strain of the *Plasmodium falciparum* parasite was first discovered in Kenya in 1982 (American Association for the Advancement of Science 1991). It is suspected that the problem could have existed even earlier. The level of this resistance has now reached 20% in Western Kenya and 50% in the Coast Province. There is also an emergence of multiple drug resistance in Africa. This highly increasing trend is the most important biological factor affecting malaria control (WHO 1987; Winch et al. 1994; Gomes and Litsios 1993). There is also the problem of inadequate financial and human resources devoted to

control efforts (Ojiambo 1986; AAAS 1991). In Africa, there is limited health coverage arising from poor and maldistributed human resources. In this regard, the socio-economic development of a country has an important role in determining the health status of people. African countries are unable to provide for health and other social services due to the declining Gross National Product/Gross Domestic Product.

According to Ojiambo (1986:42):

The successful implementation of a malaria eradication programme requires a certain level of socio-economic prosperity. In areas where such prosperity is wanting, malaria poses a serious health problem and is a known impediment to general development.

A shortage of trained malaria researchers also constrain control efforts. This is a problem especially in relation to research on the social and economic factors associated with the epidemiological form in which transmission occurs. Little has been done to ascertain the demographic implications such as death and disability rates of the disease. Therefore, lack of vital data pose a problem to malaria control in Africa (Ojiambo 1986) and the world as a whole. Generally, people's perceptions and knowledge of health and disease may influence their acceptance of control innovations (WHO 1987). In many rural societies, malaria is not perceived as a health risk which can result in death (Ojiambo 1986). In a research carried out in Malawi, Steketee et al. (1994) found out that the variety of maternal and foetal effects of malaria demonstrated that women had poor knowledge of the effect of malaria during pregnancy. Although people may uniformly perceive malaria as a problem, they do not automatically take it as a health priority. Cases may be associated with fever but the perceptions of malaria as a disease vary from place to place (Mugambi 1986; Kaseje 1986 a, b).

Administrative and operational problems also hinder malaria control programmes.

The programmes require adequate logistic support (Ojiambo 1986; WHO 1987). However, the lack of logistic backing together with insufficient training for health-oriented personnel to deal with malaria situations strongly retard control strategies. The overall cost and logistical impracticability are, therefore, a great milestone for the malaria control efforts. Apart from administrative barriers, large scale mosquito control programmes are rendered less feasible due to biological resistance and financial reasons (Steketee et al. 1994). Movements of people, and their other habits, are also key factors in planning malaria control programmes (Ojiambo 1986; WHO 1987; Knell 1991). Human movement has always been discussed in relation to international tourism and travel. Little emphasis has been laid on the movements of local people within the framework of domestic tourism and travel and local socio-economic activities. Imported malaria (Knell 1991) has been attributed to human mobility at the international level. On the other hand, most of the literature does not indicate the efforts which have been made to understand culturally conditioned behaviours associated with the spread and control of malaria in local-specific areas. The literature also indicates that most of the work carried out on malaria has been biomedically-oriented. Particular socio-cultural factors that may influence the utilisation of programme facilities have been highlighted only in a few instances. It is worth noting here that health programmes necessarily involve the introduction of new practices and changes in values and beliefs into the culture of the society. If such programmes are to be constructive forces, the social structure, local cultures and the traditional way of life of the community must be taken into account and utilised.

The problem of malaria in sub-Saharan Africa is also blamed on the inadequate allocation of resources to the health sector by governments. This accounts for the



insufficient health facilities and staff training (World Bank 1980). The laxity of governments to provide adequate resources hinders the proper implementation of community-based malaria control programmes. For example, community health workers are not well trained to handle health issues. This is consistent with the findings reported from Kola district, Sierra Leone, that the four to eight weeks of CHW training would not enable them to deliver health services well (Unger et al 1990). Also, the health workers may drop out due to poor remuneration or a complete lack of rewards. On the governments' failure to support malaria control, Harrison (1978: 259) comments:

Governments were not convinced it was worthwhile and were unwilling to push or pay for it. Malariologists neglected to bring out cost-benefit models to prove that it may pay more than it costs to keep people healthy.

Accurate diagnosis and valid treatment of malaria may be problematic in control programmes. The local understanding of malaria and its treatment influences how well drugs and other facilities are used. Therefore, monitoring antimalaria activities should be accompanied by the assessment of whether antimalarials are being used correctly by community members (Steketee et al. 1994; Djimde et al. 1998). The prompt recognition and proper treatment of malaria should reduce malaria-related morbidity and mortality (Lipowsky et al. 1992). However, this can not be realised without the understanding of the people to whom control activities are directed. According to Jaywardene (1993), illness has no uniform effect: it has different effects upon different people, activities and decisions.

Control strategies have emphasized the reduction of human-mosquito contact at the individual and/or household levels. This can be realised through the use of bednets, mosquito repellents as well as burning synthetic or natural substances. The use of



eaves-curtains made from sisal strands and treated with permethrin is a potentially effective substitute for the standard cotton and nylon fabrics used in malaria control. According to Oloo et al. (1996:735), sisal eaves curtains seem to meet the criteria for devices that are inexpensive and can be sustained in a rural community. In the view of MacCormack (1984: 84) the WHO might also assist in the development of simple household technologies for making pyrethrum into mosquito coils, repellent applied to walls, bednets, sheets, clothing or the body. Also window screening and environmental manipulation measures such as draining stagnant water are some of the methods that can keep mosquitoes away. However, we are not told how different people would view and actually participate in these malaria control activities. Also, there is little information on how these measures are used in sub-Saharan Africa. Little is known about the attitudes of the affected peoples towards these measures (Lipowsky et al. 1992; Abdullah 1984). The correct usage of control measures by the local populations is crucial in exerting a significant impact on malaria. A limited understanding of the social and cultural responses to malaria hinder the attainment of high levels of the correct usage of control services (Winch et al. 1994).

### **2.1.3. Social, Cultural and Environmental factors in Malaria control**

Debilitation, premature death and periodic illness associated with malaria entail social and economic costs. The social networks in the community play a major role in the treatment and prevention decisions. A social network is a set of persons with specific cultural identities and associations that relate them to one another. Culturally related people in such a network are bound by a set of role expectations which include helping the sick person to choose the best course of action. Such a therapy management group

usually consist of relatives, friends and neighbours (Sullivan 1987; Sindiga 1995). Among the Luo of Bar Chando, similar social networks exist and interpersonal relationships culture as well as the ecology are as directly linked with the people's health status (Kawango 1995:80). The social network allows victims of a disease to test their experiences against those of others in the same network. This produces reinforcement or modification of one's judgement and subsequent behaviour (Lasker 1981). This is an important aspect to be considered in designing malaria control programmes. The social aspect also reflects the need for cooperation between health workers and the people affected. Depending on the relations between the local people and the community health workers, surveillance efforts are differently affected. According to Hughes and Hunter (1970), malaria eradication and control in Africa is increasingly resolving itself into problems to do more with understanding and control of human relations aspect than with the biological aspects. On the other hand, case surveillance can be influenced by the physical distance of some communities and the health providers. For instance, evidence from India during the 1960s indicated that health teams routinely avoided remote villages and concealed their delinquency by taking excess blood samples from families more easily reached (Harrison 1978).

An integrated malaria control programme would require an understanding of a complicated natural system, that is, mosquitoes, malaria parasites, the people and the environment. The environmental component includes all older tactics superseded by the modern grand eradication campaign which comprise larviciding, colonizing mosquito breeding places with predatory fish and personal defence tactics such as using bednets and mosquito repellents. This means that malaria control programmes should motivate

antimalaria behaviour which could range from the avoidance of mosquitoes, reduction of the vector population, to the appropriate use of drugs (Barlow 1991; Kaseje 1991; Young and Duston 1987). Also, the cultural traditions which influence the rate of malaria transmission should be considered. These traditions include clearance of forests for farming, creation of swamps, choice of building sites and the concentration of population near mosquito breeding grounds (Laderman 1975; MacCormack 1984; Mwabu 1991; Abdullah 1984; Dubisch 1985).

Other socio-cultural factors related to malaria prevalence include the types of houses or shelters and their ventilation. Activities such as fishing, drawing water, staying outdoors in the late evening hours and mode of dress also have an influence on malaria transmission (Knell 1991; Abdullah 1984). According to Mwabu (1991: 167), information on the interdependence between economic, environmental and sociocultural factors and malaria is required for the design and implementation of successful programmes. An understanding of behavioural patterns that expose community members to malaria is equally important.

#### **2.1.4. Knowledge and perceptions of malaria control strategies**

Most communities in malarious zones have their own local knowledge concerning malaria related illnesses. They have also devised local techniques of dealing with the disease. Although ethnoetiologies may not comprise the mosquito theory, each community tends to have its own environmentally specific ways for the prevention and treatment of malaria. With time, however, it seems that traditional malaria concepts and beliefs blend with the knowledge derived from modern medical concepts (Lipowsky et al. 1992; Abdullah 1984). For instance, in a study conducted in Columbia, Lipowsky et al.

(1992: 632) found out that where modern health care is provided, the ideas and behaviours towards malaria are mainly influenced by the malaria control programme. On the other hand, the co-existence of the professional, popular and folk health sectors has enabled many communities to have some knowledge of malaria to the extent of adopting the name "malaria" in their medical vocabulary (Abdullah 1984; Winch et al. 1994; Lipowsky et al. 1992). Studies also indicate that some local descriptions of malaria illness symptoms tally with those provided in clinical malaria (Steketee et al. 1994; Jackson 1985). However, the perceptions of malaria as a health risk and responses to this disease vary from place to place (Kaseje 1986 a, b, 1991; Steketee et al. 1994; Ojiambo 1986) and from person to person (Jaywardene 1993). This is due to the different socio-cultural and environmental implications of malaria transmission.

Local cultures mediate between the people and their environments in such a way that differences are found between and within societies regarding the perceptions of health and illness (Etkin 1991; Anderson 1996). These differences influence the knowledge and utilisation of control strategies having biomedical components. The knowledge and perceptions of malaria control interventions vary with the knowledge and perceptions about the disease. In a study conducted in Dar es Salaam, Tanzania, Mnyika et al. (1995) found out that women with a high knowledge of malaria were more likely to use malaria prophylaxis than those with low knowledge. However, no significant association was found between the knowledge of malaria and perceived effectiveness of the various strategies of malaria control. Compliance with biomedical innovations in malaria control has been found to be influenced by perceptions of the side effects. The perceptions of malaria control strategies have been closely linked to uncertainty about

the strength and validity of medicines provided to cure or protect people against malaria (Abdullah 1984; Jaywardene 1993; Mnyika et al. 1995). However, studies on the knowledge and perceptions of malaria control strategies have not stressed the intracultural variations with reference to structural variables such as age and gender.

Understanding the knowledge and perceptions of the affected population is of great advantage to programme planners and implementers. This is because new health habits can be successfully introduced after ascertaining the function and meaning of existing habits and practices (Young 1976,1981). According to Etkin (1991), gender is one of the most important demographic variables which may be crucial in improving participation in malaria control programmes. The perceptions and knowledge of health problems and interventions are embedded in culture and social classes. Individuals may have unique patterns of health- seeking behaviour mediated by socio-cultural differences. The people's perception about community-based health providers can also influence community participation in malaria control programmes. In the their study of Katana health zone, eastern Zaire, Delacollette et al. (1996) found out that the ambiguous position of CHWs in the health care system created problems that would compromise the sustainability of malaria control intervention.

#### **2.1.5. Ethnomedical practices in malaria control**

Ethnomedicine refers to the beliefs and practices relating to diseases which are the products of indigenous cultural development and are not derived from the conceptual framework of modern medicine (Hughes 1985). Some studies indicate that the traditional healing and disease prevention practices are usually employed besides modern medicine (Foster 1983; Bannerman et al. 1983; Mbeja 1997; Mutero et al. 1998).

Therefore, there is a continuous interaction between folk treatment practices and professional (biomedical) treatment. The perceptions of both men and women towards their indigenous treatment practices may influence their attitude toward contemporary health services.

In a study concerning sociomedical aspects of malaria control in Columbia, Lipowsky et al. (1992) found out that the use of programme services co-existed with traditional healing practices. Traditional healers and "Spleen-prayers" were consulted in healing ceremonies. It was observed that:

Treatment of malaria with medicinal plants seems to be a logical development emerging from people's traditional concept of disease (Lipowsky et al. 1992: 635).

The study above indicated that the failure to use the correct dosages of chloroquine treatment was due to the side-effects which included itching, headaches and fatigue. However, the bitter taste of chloroquine did not bother the people. It was held that the acceptance of chloroquine was probably due to the fact that the medicinal plants traditionally used to cure malaria also have a bitter taste. Therefore, this factor might have contributed to the population's readiness to accept chloroquine and to try new bitter plants and medicines against malaria. People tend to evaluate new services and treatment on the basis of the knowledge acquired in their ethnomedical practices. As such, new preventive measures may be readily accepted by people who have such concepts of prevention in their health care system (Abdullah 1984). Therefore, the responses to diseases are guided by the already existing knowledge in a society. In Sri Lanka, Silva and Tudor (1991) found out that a local plant called madurutala (Ocimum sanctum), which was widely known for its mosquito repellent qualities, was literally referred to as "mosquito plant". Such knowledge can facilitate the acceptance of modern

mosquito repellents. According to Mugambi (1986), there are several tiers of diagnosis and treatment and these may include traditional healers, formal health facilities and commercial sources. These sources of care will need to be identified and the information used in planning malaria control trials. Therefore, there is a need for biomedical practitioners to rework the medicines' paradigms of clinical practice to be more responsive to indigenous patient values, beliefs and expectations.

According to Etkin (1991), all societies have established criteria by which they judge health. It is on this basis that the prevention and treatment of illness is elaborated. Hughes (1985) asserts that ethnomedicine may contain therapeutic and preventive measures many of which are empirically efficacious by standards of modern medicine. Basing on ethnomedical knowledge some societies have adopted their own methods of keeping mosquitoes away, for example, burning leaves, dung or fire in the house (Vundule and Mharakurwe 1996; MacCormack 1994; Mutero *et al.* 1998). Elsewhere in Tanzania, Fivawo (1986) reports the use of *Mvumbasi* (*Ocimum Sanitum*) as a mosquito repellent. Whichever method is employed, it is important to determine how the use of ethnomedical practices vary and/or associate with demographic variables such as gender and age.

#### **2.1.6. Utilisation of malaria control services and facilities**

According to Andersen (1995), an analysis of the use of health services must consider how people view their own health as well as how they experience the symptoms of illness, pain and how they are worried about their health. Individual's personal and social circumstances also influence their desire for professional help. In general, women consult health providers more than men (Scambler 1986; Steketee *et al.* 1994). Also,



social class, ethnic origin and family size are related to the utilisation of health services.

The differences in illness behaviour reflect different culturally learned styles of coping with the world at large. In their study in Ghana, Belcher et al. (1975) observed that the beliefs about illness and the development of awareness and interest in the clients about the malaria control programme are the determinants of programme participation. Thus, illness behaviour may be accounted for in terms of socialization. People may delay to seek help when ill until symptoms are no longer tolerated (Coe 1970; Zola 1973; Mbeja 1997). Also, the perception of the costs and benefits may influence the use of services and facilities. People may deem obtaining treatment less urgent than other activities, such as, looking after children at home, being at work or going on holiday (Scambler 1986; Jayawardene 1993). The value an individual attaches to good health varies with his or her own perceptions of the benefits versus the costs of the accomplishment. Access to the health care facilities is another important factor determining usage (Andersen 1995; Mwabu 1986; Jayawardene 1993, Scambler 1986; Mbeja 1997). As the distance between the home and general health care practice increases, the likelihood of consultation diminishes. It is, therefore, important to ensure that there are accessible sources of antimalarials (Steketee et al. 1994).

The availability of home remedies also influences the utilisation of programme services. Before seeking treatment outside the home situation, self-medication is used (Ruebush et al. 1995; Mbeja 1997; Abdullah 1994). This may be a substitute for, or an addition to, professional care. The severity, specificity and duration of symptoms after trying home remedies dictates the direction of the health-seeking behaviour (Jayawardene 1993). Self-medication in malaria treatment is probably based on the fact



that malaria may be less dramatic at times. Upto four days may pass without any debilitating symptoms. Apart from ignoring the symptoms, alternatives to consulting a doctor or self-medication include faith-healing and herbalists (Scambler 1986; Bannerman et al. 1983). The proper treatment of malaria and other illnesses may be postponed or ignored due to the use of self-prescribed biomedical and/or ethnomedical remedies. According to Nyamwaya (1995: 36), delayed referral of complicated cases occur due to the patient's false sense of hope in ethnomedicine. Actual and perceived side-effects of malaria drugs such as chloroquine impede their use. Itching, vomiting, fatigue and addiction have been given in the literature as the most common side effects of malaria drugs. However, very little has been said concerning people's perceptions of the strength of the medicines.

Studies on the use of bednets indicate that local perceptions about seasonality, cultural differences as well as socio-economic factors determine levels of bednet utilisation (Stich et al. 1994; Winch et al. 1994; Mnyika et al. 1995; Brinkmann and Brinkmann 1995; MacComarck 1987; D'Allesandro et al. 1994). According to Winch et al. (1994), fluctuations in the use of impregnated bednets in Bagamoyo, Tanzania, were due to three factors:

- i. the mosquito densities and perceived nuisance from mosquitoes.
- ii. the perceived risk of contracting illness associated with mosquitoes and
- iii. the discomfort associated with sleeping under a net due to high heat and humidity.

In the Kisumu B.I. communities, the mosquito nets were reported to be popular (McPake et al. 1991). However, we are not told about the relationship between the use of the nets and perception of the cost among the various users.

### 2.1.7 Gender differences in malaria control

Information on the gender aspects in the control of tropical diseases is scanty. The literature on the general utilisation of health services indicate that there are gender-based differences in health-seeking behaviour. "Gender" refers to the sociocultural aspects of the male-female dichotomy, as distinct from "sex" which is biologically determined (Hillier 1986). All cultures have assumptions of what is appropriate health behaviour for men and women. The cultural expectations may also have a bearing on how men and women use malaria control measures. This can also be seen in how they participate in the implementation of programmes through membership in village health committees and as community health workers. Failure to consider gender differences may lead to errors in epidemiological surveys and diagnosis. Cultural barriers can inhibit the prompt diagnosis of malaria among men, women and children. Etkin (1991) observes that differential risk patterns may be defined by occupation, sleeping and clothing practices. He considers a case of malaria incidence among Sri Lankan men and women and notes that malaria may be under-reported among women because they refuse examination by the predominantly male cadre of health personnel involved in malaria detection. According to Hillier (1986), many societies depict women as social stereotypes of weakness and instability. Consequently, symptoms may be dealt with in a way which reinforces and reflects women's lack of control over their health. On the other hand, a pregnant woman would decide that malaria treatment will be harmful for the unborn child. She may, thus, avoid seeing even a therapist to obtain advice (Steketee et al. 1994; Jayawardene 1993). Additionally, the low literacy levels among women have serious implications on malaria control efforts. Lasker (1981) holds that women are more likely to use traditional healing practices than men although more men than women are herbalists and medicinemen.

## **2.2.0 Theoretical Frameworks**

This study uses the ecological theory and the Health Belief Model (HBM) to describe the knowledge, perceptions and use of malaria control services within the Bamako Initiative programme in Bar Chando sub-location.

### **2.2.1 Ecological Perspective**

Ecology is the study of the relations between organisms and their environment. The total effect of the relationships are explained in the ecological theory (Baker 1962). In medical anthropology and sociology, the term environment includes three components. First, there is the physical environment which includes the weather, climate and geography. Second, the biological environment which comprises the interaction between biological units, that is, human beings, disease vectors and the pathological processes. Third, there is the social and economic environment which may include the type of occupation and location of the home (Coe 1970; Frake 1962). The term environment is used here to call attention to the need to understand human beings in their total settings if solutions to health problems are to be found. According to Rogers (1960), external forces act on the basic genetic endowment to determine what happens to human beings. He notes that, in this sense, the environment includes both the material and spatial aspects of man's world as well as the non-material webs of human social relations. These relations are constituted of culture which profoundly influence the health state of human beings. It is in culture that people derive meaning, symbols, perceptions and practices related to health. In the ecological perspective, man's health status is a function of the interaction between the biological components and the total environment.

The ecological framework holds that the relative state of the health of human beings and the occurrence of most illnesses are greatly influenced by the combined effects of multiple factors arising from the environment. Also, social conditions are regarded as being part of the environment. There is an interaction between these conditions and the environment which affect health in various ways. In the first place, social conditions may create a predisposition to disease. They can also cause a disease directly or influence the course (process) of a disease. Social conditions, such as, lack of education or income, may result in delayed or inadequate medical care, or, possibly the failure to get it at all (Rogers 1960).

According to Rogers (1960), the environmental factors that have possible effects on health care can be categorised as material and non-material. Intrinsic non-material environment includes aspects such as age, sex and hereditary characteristics. On the other hand, extrinsic environmental factors include topography, climate, occupation and other aspects of the human micro-and macro-environments (Rogers 1960; Singer 1990; Anderson 1996). The biological environment having a possible influence on health status include food, sanitation, disease agents and vectors of disease producing agents (Rogers 1960; Newman 1962). Finally, there is the social environment which encompass relations between human beings and their conditions of living. The extrinsic factors affecting the human being's conscious and/or unconscious behaviour are also given. These include notions, beliefs, ideologies, values, goals, social norms, life experiences such as socialization, education, trauma and stress, satisfaction and awards as well as other cultural factors (Rogers 1960: 169). In general, the ecological approach to medical care considers the health status of human beings as a function of the genetic human being and the total effects of the environment. White et al. (1980) argue that the

complex interaction between ecological factors may inhibit or facilitate access to and delivery of health care to individuals and communities. These factors are described as social, psychological, economic, informational, administrative and organizational.

### **2.2.2 Relevance of the Ecological Perspective to the study**

The ecological theory focuses on the interrelations among the disease agent, vector and the host within a particular ecosystem. This approach enables us to learn how individual manifestations of culturally prescribed behaviours contribute to the risk or protection from malaria infection. The ecological framework makes it possible to consider the human host separately so as to supplement biomedical efforts in malaria control. Thus, it values demographic factors such as gender, which is the general focus of this study. The ecological theory has laid an adequate foundation for investigations into the perceptions and knowledge of disease and its control which can be safely categorized as intrinsic ecological or environmental factors in health status. The ecological perspective combines physical conditions, habits, customs and lifestyles which are important variables in epidemiological research (cf. Frake 1962; Baker 1962; Anderson 1996). It is within the ecological perspective that we can understand some components of culture which are relevant in health research. For instance, language, meaning, symbols, perceptions and practices can be understood so as to design health education messages. Within this theory, socio-cultural and economic variables which may cause the failure or success of malaria control can be easily examined.

The ecological theory recognizes the fact that target populations may already have established customs related to health and environmental issues. Infact, the Luo have preventive, adaptive and curative strategies to cope with ill-health drawing from their culture and ecological setting (Kawango 1995:80; Kokwaro 1972). The objectives

of this study can fruitfully be realized using such a basis of argument. This would form the base for recommendations on how to make community-based innovations a success.

For example, the implementation of the Bamako Initiative's malaria control component should be informed by the ecological theory. The diversity in the physical and sociocultural environments on the African continent also requires an ecological approach to disease control. This approach is important in our assessment of the Bamako Initiative in terms of whether it is a true representation of the Luo Culture. The ecological approach can also guide us in our endeavour to find out whether the B.I. meet the Luo beliefs about the control, prevention and cure of malaria.

According to Kawango (1995), each culture has developed mechanisms of coping with disease and illness. Therefore, malaria control programmes need to be informed of local health beliefs in order to understand how these influence treatment and prevention. The ecological theory is also in line with the preventive model of most of the malaria control programmes. Preventive medicine focuses its activities on removing or changing aspects of the environment which are harmful to health. In this context, ways can be found through which people can be sensitized to avoid contact with mosquitoes, for example, by draining stagnant water, clearing bushy compounds and window screening. Therefore, the total human environmental conditions which enhance the persistence of malaria can be studied within the ecological approach. Behaviour and cognitions about disease and its control are based on concrete experiences within a given environment. Although people may attach a high value on health, a decision to do anything about it could have material or behavioural costs. It is, therefore, necessary that competing interests in the environment be uncovered. Practically, extrinsic

environmental factors can be influenced by appropriate behaviour. Any change in the non-material environment would require the acquisition of the relevant knowledge through health education. Also, the motivation to apply the knowledge is necessary for the success in changing man-made factors in the environment, such as, cultural beliefs and practices.

### **2.2.3 Health Belief Model (HBM)**

This is a model of illness and health care utilisation advocated by Kasl and Cobb (1966), Rosenstock (1966, 1974), and Kirscht (1974). This model brings together all factors from the demographic to the psychological which influence individual judgement of costs and benefits involved in seeking medical help. The model was developed to assist in the understanding of why families use health services and to define and measure equitable access to health care (Andersen 1995). The health belief model encompasses health behaviour, illness behaviour and the sick-role behaviour. It suggests that the people's use of health services is a function of their predisposition to use the services, factors which enable or impede the use and their need for care. Age and gender are presented as some of the demographic factors which influence a need for health services. Beliefs are also classified among predisposing factors for health service utilisation. Andersen (1995:2) defines beliefs as:

... attitudes, values and knowledge that people have about health and health services that might influence their subsequent perceptions of need and use of health services.

The HBM can be integrated with the health behaviour model to explain the use of health services, especially, preventive behaviour. According to Kasl et al. (1966: 246):

Health behaviour is any activity undertaken by a person believing himself or herself as healthy for the purpose of preventing disease or detecting it in



asymptomatic stage.

However, preventive health behaviour is motivated by the perception of susceptibility, seriousness and salience to the disease as well as the benefits and barriers to such preventive action (Shuval 1981). In this regard, the health belief model indicates that all determinants of health behaviour are socially and culturally determined.

With reference to malaria control, health behaviour would include all the activities undertaken by the individual to avoid the malaria parasite or to treat the illness, for example, by taking antimalarial drugs, using bednets and mosquito repellents and destruction of mosquito breeding grounds. Non-conformity to the conventional malaria control activities can be regarded as negative health behaviour.

Kasl et al. (1966) defined illness behaviour as any activity undertaken by a person who feels ill to define the state of his or her health and discover a suitable remedy. Within the HBM the sick role includes all activities undertaken by someone who perceives himself or herself as ill so as to restore good health. Entry into the sick role is determined by a variety of situational and normative variables which are socially and culturally defined (Shuval 1981). According to the HBM, an individual will enter any kind of health, illness or sick role behaviours depending on four factors:

- a. perceived seriousness and potential consequences of symptoms;
- b. Threshold of their (symptoms') visibility;
- c. The availability of information about the disease; and ,
- d. Assumptions about causation.

Additionally, the HBM postulates that the choice of a treatment or preventive action depends on the perceived probability of success of such an action (Cockerham 1992). Perceived socio-economic costs of an action may prevent or facilitate the adoption of some disease control measures.



## **2.2.4 Relevance of the Health Belief Model to the Study of Malaria Control**

The propositions in the HBM are helpful in the descriptions of the reasons for the use and non-use of the B.I. malaria control services. The theoretical orientation in the model can be used to consider demographic aspects such as ethnicity, gender and age. The model considers the individual and the sociocultural factors which are relevant to disease control measures. These are the factors which may influence the readiness of community members to utilize malaria control measures advocated for in the Bamako Initiative. By targeting the sociocultural and psychological determinants of health behaviour, the HBM indicates the variables that can be translated into programmatic initiatives. Significant sociocultural variables suggest appropriate educational strategies for interventions (Glik *et al.* 1989).

The model is also adjustable to both the households and individuals as units of analysis. It is also a strong basis for understanding health behaviour with specific reference to malaria control. By using the health belief model in the study about the perceptions and utilisation of the malaria control interventions, structural variables such as knowledge about the disease can be identified. This can highlight the changes to be made in the health delivery services of the Bamako Initiative, so that, they may become responsive to the needs of the target population.

### **2.3.0 Working Hypotheses**

This study was guided by the following hypotheses drawn from the literature review and theoretical frameworks.

1. The use of the Bamako Initiative malaria control services is related to the perceived costs and benefits of using the services.

2. Participation in the malaria control programme varies with perceived risks of malaria illness.
3. Decisions concerning prevention and treatment of malaria using modern services are mediated by ethnomedical practices.
4. Accessibility to the other health facilities and services influences the use of the B.I malaria control services.

### **2.3.1 OPERATIONAL DEFINITIONS**

#### **2.3.2 Use of the B.I. malaria control services**

This was measured by the answers showing that the respondents actually used services and employed the principles of the Bamako Initiative. The indicators were the use of bednets, taking preventive medicine (prophylaxis), the use of the right medicines in treatment, clearing compounds, draining stagnant water, and good house ventilation. Some of these indicators were observed directly and recorded.

#### **2.3.3 Perceived costs and Benefits**

The perceived costs and benefits were measured by the responses indicating the advantages and disadvantages of engaging in malaria control activities, for instance, the side-effects of malaria medicines and the domestic constraints of acquiring bednets. Responses showing immediate or delayed efforts to seek treatment were also indicators of the perceptions of costs and benefits. The preference of alternative sources of malaria remedies and an indication that a lot of time and money were involved in malaria treatment were also determined. The reasons for not purchasing bednets and the perceived problems of their use were also used to measure the perceived costs and benefits. Also, the responses showing that malaria interfered with any or some socio-economic activities were indicators of the benefits of prompt malaria treatment.

#### **2.3.4 Participation in malaria control programmes**

This comprised responses indicating the use of malaria medicines and bednets supplied by the Bamako Initiative. The responses showing a knowledge of modern malaria control methods indicated participation in the initiatives education activities. Also, a knowledge of the principles of the B.I. such as setting up a revolving fund was used as an indicator of participation. Additionally, responses about having seen community health workers doing their work from door-to-door indicated participation.

#### **2.3.5 Malaria treatment and prevention decisions**

These are the actual stages in an individuals health-seeking behaviour associated with malaria illness. The decisions were determined by what respondents said they did when they became aware of malaria signs. The reasons given for prompt action, delayed treatment and preference for immediate hospital treatment were recorded. The respondents' views regarding the use of non-commercial/traditional mosquito control measures versus the modern methods advocated for in the BI were also noted. The reasons for the use and non-use of the B.I. and what people said should be done to improve the B.I. were regarded as the respondents' views of what interferes with their decisions to use the B.I. services.

#### **2.3.6 Ethnomedical practices**

Ethnomedical practices are the treatment and prevention measures based on the beliefs and practices that are not drawn from modern medicine. The practices result from indigenous cultural development. For the purpose of this research, ethnomedical practices included the respondents' indication that they used medicinal plants and rituals to treat malaria associated illness. The use of prayers indicated the use of magico-

religious healing which is here considered as a component of ethnomedicine. The use of unprescribed antimalaria medicines and other non-malaria tablets was considered as an indication of the transition from the folk healing sector to the modern professional sector. Folk beliefs regarding the causation and spread of malaria were elicited as predispositions to the use of folk practices in the treatment and control of malaria. All activities in the use of home remedies and unprescribed dosages of medicine intended to treat malaria were described and recorded.

### **2.3.7 Accessibility to other health care facilities**

The access to other health care facilities was measured in terms of how the respondents viewed the physical distance between their homes and the Bamako Initiative centre, community health workers and other sources of health care. Inaccessibility to the B.I. services was indicated by the rate at which respondents acquired drugs and nets from the initiative as compared to the other sources such as shops and health centres. The respondents' views about the CHWs and the community pharmacy gave clues as to whether the B.I. is more accessible or not. The perceptions of the costs and satisfaction with the B.I. services supplemented indicators of accessibility. Responses about the last time the respondents met community health workers was also an indicator of accessibility to the B.I. services.

### **2.3.8 Perceived Risks of malaria**

These are the responses to the question whether malaria kills, the mosquito is a dangerous insect and whether malaria is serious problem to pregnant mothers. Responses showing that everyone needs the bednets and that there is need to take

preventive medicine were also used to measure perceived risks of malaria. This was also indicated by how quick respondents said that they seek treatment when they realized that they had malaria.

In conclusion, this study examines the relevance of the Bamako Initiative as a community-based malaria control programme in Bar Chando sub-location. The prevailing beliefs about malaria, mosquitoes and how the local people react to them are considered as structural variables which would have an impact on the success of the B.I. Programme. The community knowledge about malaria causality, transmission, symptoms and how it is likely to influence local participation in malaria control is studied. The people's awareness, knowledge and perceptions of the B.I. activities and services are also examined in a view to find out how these factors influence the use of the B.I. malaria control services. Similarly, the sociopsychological, cultural, economic and other variables of accessibility are examined to establish the extent to which they are either barriers or motivations to the people's likelihood to taking the recommended malaria control actions. The B.I. was introduced in an environment of emerging medical pluralism. Therefore, the effectiveness of the Initiative's malaria control component is assessed in the context of other already co-existing traditions of treating and preventing the disease.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 INTRODUCTION

This research was carried out in Bar Chando sub-location, North Sakwa location, Bondo division (see Map 5). It involved daily trips from Bondo township which served as the base for the fieldwork. Since this study did not entail the use of participant observation techniques, the researcher found it convenient to stay in Bondo, where accommodation was easy to find. Daily interactions with the local people helped to improve the rapport with them and this increased their willingness to be interviewed.

##### 3.1.1 Site Selection

Bondo division was chosen as the study site because it is within the focus area for the Kenya-Danish Health Research project (KEDAHR) which sponsored this fieldwork. The KEDAHR project started its activities in Bondo and Usigu divisions with two broad objectives:

1. To strengthen the research capacity of participating institutions within the fields of parasitology, nutrition, educational psychology, social anthropology and health services researches; and,
2. To contribute to the improvement of the health status and school performance of Kenyan primary school children primarily by control of helminth infections and improved nutrition.

Bar Chando was selected purposively because it was by then the only sub-location where the Bamako Initiative was established and operative. Since the focus of the research was on the knowledge, perceptions and use of the Bamako Initiative's community-based malaria control services, Bar Chando was the ideal research site. It is also a typical rural area where the utilisation of health facilities can be adequately

studied. Since the population in Bondo division is homogenous, the investigator considered Bar Chando to be representative of the other sub-locations. Inferences from Bar Chando sub-location can, therefore, be safely applied to the other areas in the division. This is because the Bamako Initiative is affiliated to only a few rural communities and the lessons from the selected site will be highly beneficial to the implementers of the B.I. in Kenya.

### **3.1.2 Site Description**

Bondo division is situated in Siaya District in Nyanza Province of Western Kenya (Map 2). The district is bordered by Busia district to the north, Vihiga and Kakamega districts to the north-east and Homa Bay district, across the Winam Gulf, to the South and the west is the Lake Victoria (Map 3). The district covers a total area of 3,523 Km<sup>2</sup> out of which 1,005 Km<sup>2</sup> is under water in Lakes Sare, Kanyaboli and Victoria. The district lies between latitude 0° - 26 South to 0° - 18 North and from longitude 33° - 58 East (Kenya Government 1993). The district comprises ten divisions, namely, Boro, Urunga, Ukwala, Ugunja, Yala, Wagai, Rarieda, Usigu, Michiany and Bondo. Research indicates that Siaya District has the following health-related problems in order of severity: Malaria, diarrhoeal diseases, upper respiratory infections, anaemia, intestinal worms, urinary tract infections, measles, schistosomiasis, eye infections and pneumonia (Kenya Government 1993).

Bondo division covers an area of 387 Km<sup>2</sup> and it comprises six locations, namely, North Sakwa, South Sakwa, East Sakwa, Central Sakwa, Bondo township and south-west Sakwa. North Sakwa location has three sub-locations which are Ajigo, Abom and Bar Chando (see Map 5). There are 81,352 people in Bondo division (Kenya

Government 1993). Apart from Yala, Ukwala, Ugunja and Boro, Bondo is ranked as one of the most populous divisions in Siaya District which has a total of 294,313 people. In the 1989 census, Bondo Division had a total of 99,161 people (Kenya Government 1994). This accounts for 33.7% of the total population of Siaya District. The population is made up of entirely the Luo ethnic group. However, there are isolated cases of people from other communities who work in public institutions and some women who have been married from other ethnic communities of Kenya.

The division is within the modified equatorial climate with a strong influence from the local relief and lake Victoria. There are few elevated land masses going upto 1,280 metres. Generally, Bondo division portrays a plain like terrain. The modified climate in this area manifest sub-humid conditions and falls under the broad tropical type of climate. The annual rainfall here ranges between 1,400 mm and 1,800 mm. The long rain season is expected to occur from March to June with a peak in April and May. The evaporation rate In Bondo is about 1,450 - 2,200 mm. (Kenya Govt. 1993).

Bar Chando sub-location falls in the eastern region of Bondo division (Map 5), which can be described as relatively wetter, with two crop seasons. Most of the areas in the sub-location are still under indigenous vegetation which keeps the area relatively green during the wet season. The sub-location can generally be described as bushy. On the other hand, heavy erosion takes place in the area as indicated by deep gullies on main access roads and paths. Like in most parts of Bondo division, Bar Chando sub-location has black cotton soils.

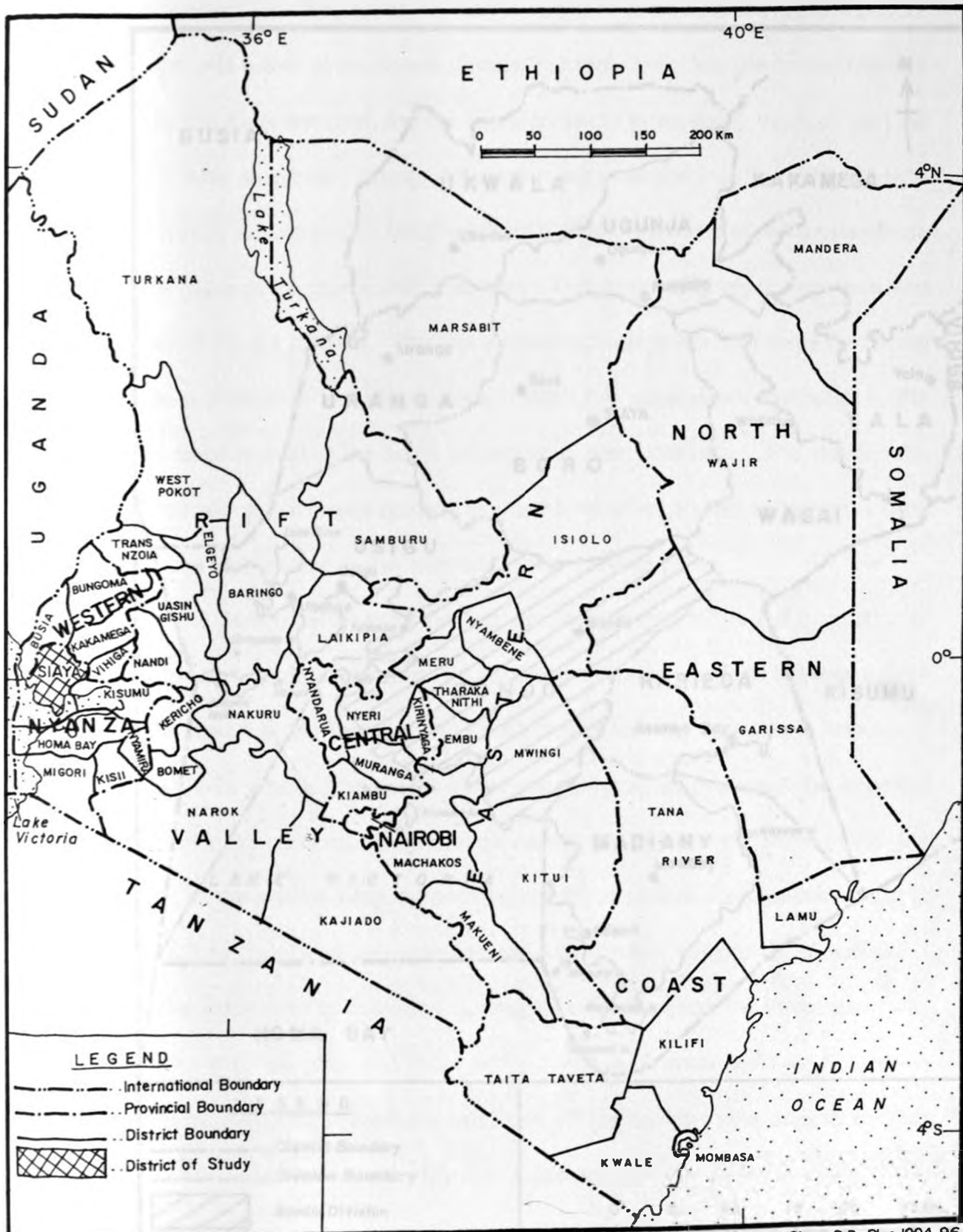
Bar Chando sub-location covers an area of 12 km<sup>2</sup> with a population density of 270 people/ km<sup>2</sup>. According to the 1989 population census, the area has 3,238 people



which include 1,546 males and 1,692 females (Kenya Govt. 1994). This population was expected to rise in 1994 to 2,000 males and 2,346 females making the total population increase to 4,346. There are 667 households in the area (Kenya Govt. 1994).

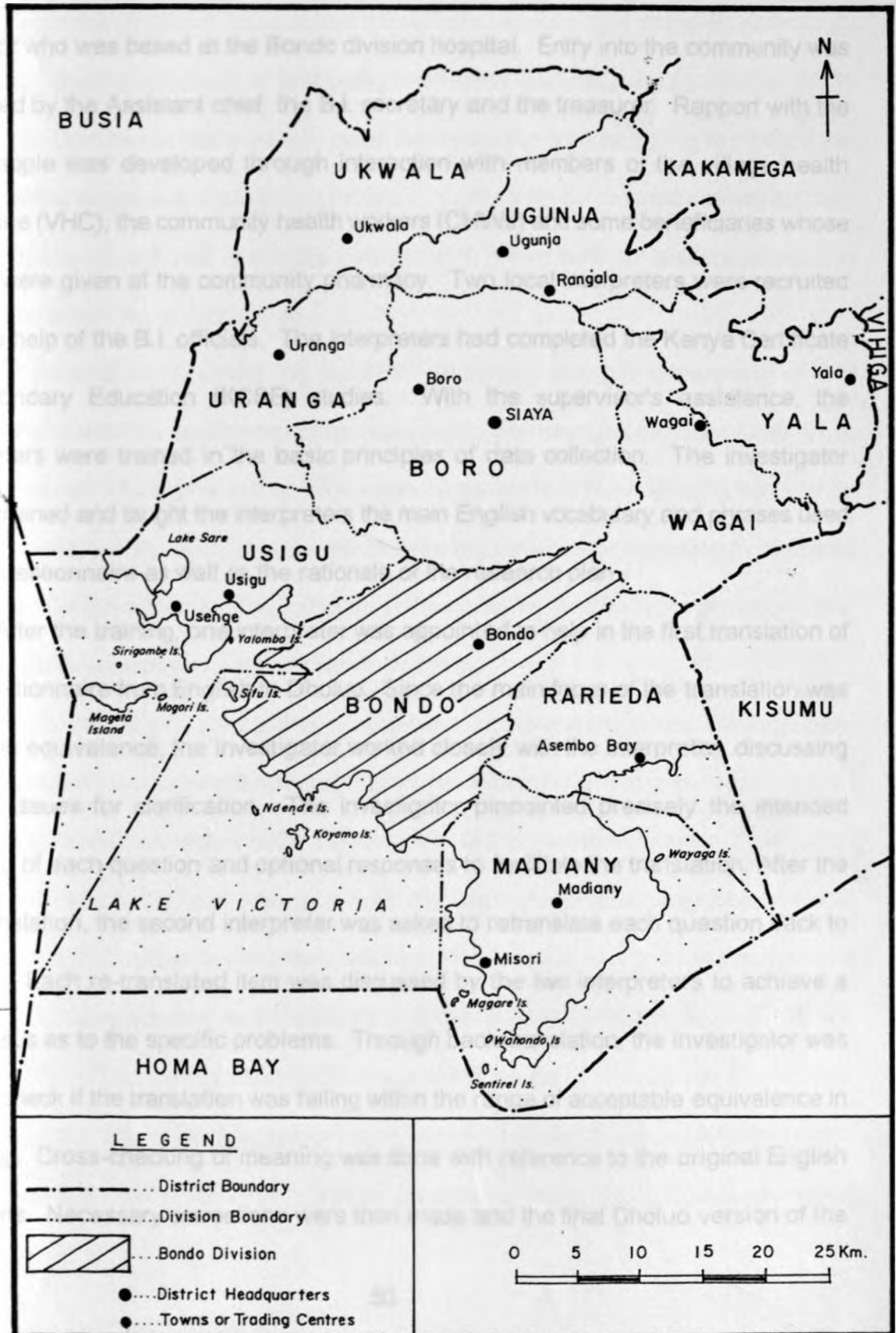
Bar Chando sub-location is relatively well drained. There is one seasonal river with two tributaries. The river is called Oluyi and its tributaries are Nyandera and Angoga which all lie to the west of the sub-location. There is also Nyamosa stream to the extreme north (Map 4). Lack of safe drinking water in the area is a major problem. The main sources of water are dams which sometimes dry up. However, unlike in other areas in Bondo division, Bar Chando is served by two of such dams, that is Nyandera and the Bar Chando dams. The former is said to rarely dry up. Some people in this area can now benefit from rain water harvesting since they have constructed water tanks.

Bar Chando is bordered by Abom sub-location stretching from North-west to the east. To the south there is North Ramba sub-location (Rarieda division) while Alingo sub-location (Bondo township) is to the south west (Map 5). Bar Chando is divided into 18 clan-villages. The names of the villages are derived from the main clans found in the area concerned (Map 4). Each clan-village is headed by a culturally recognized clan elder. There are no health centres in the sub-location except for the one now being constructed by a local women's group at Majiwa with the help of some Norwegian donors. This centre is expected to serve as a community nursing and maternity facility. Thus, the local people rely on the health facilities in the neighbouring Rarieda division, Ajigo sub location and those found in Bondo township.



Map 2. Kenya : Location of Siaya District.

Source: Siaya D.D. Plan 1994-96



Map 3 : Location of Bondo Division in Siaya District.

Source: Siaya D.D. Plan 1994-96

### 3.1.3. Questionnaire Translation and Pretesting Exercise

The Bamako Initiative community was identified with the help of the divisional coordinator who was based at the Bondo division hospital. Entry into the community was facilitated by the Assistant chief, the B.I. secretary and the treasurer. Rapport with the local people was developed through interaction with members of the village health committee (VHC), the community health workers (CHWs) and some beneficiaries whose names were given at the community pharmacy. Two local interpreters were recruited with the help of the B.I. officials. The interpreters had completed the Kenya Certificate of Secondary Education (KCSE) studies. With the supervisor's assistance, the interpreters were trained in the basic principles of data collection. The investigator further trained and taught the interpreters the main English vocabulary and phrases used in the questionnaire as well as the rationale of the research plan.

After the training, one interpreter was appointed to help in the first translation of the questionnaire from English to Dholuo. Since the main focus of the translation was semantic equivalence, the investigator worked closely with the interpreter, discussing various issues for clarification. The investigator pinpointed precisely the intended meaning of each question and optional responses to facilitate the translation. After the first translation, the second interpreter was asked to retranslate each question back to English. Each re-translated item was discussed by the two interpreters to achieve a consensus as to the specific problems. Through back-translation, the investigator was able to check if the translation was falling within the range of acceptable equivalence in meaning. Cross-checking of meaning was done with reference to the original English questions. Necessary corrections were then made and the final Dholuo version of the

questionnaire drawn in the presence of the investigator.

The questionnaire was pretested on ten respondents. 5 men and 5 women were selected purposively from a list of names drawn from receipt books at the B.I community pharmacy. During one week of pretesting, more time was dedicated to further back-translation. Continuous retranslation made the interpreters more willing to discuss the equivocalities of specific translation problems. Comments by respondents about their understanding of particular questions were noted in a field note book and later used in the refinement of the questionnaire.

At the end of the pretesting exercise, necessary changes were made on the questionnaire with the assistance of the supervisor. The changes included leaving out those questions which gave similar information. Also, some of the original questionnaire items were edited so as to acquire the desired equivalence in meaning in the local language. On the other hand, re-translation of several words and response options and deleting some unnecessary options was inevitable.

The translation and pretesting exercise was not without problems. To begin with, the interpreters' poor understanding of the research objectives was a set back. It was, therefore, a slow process to provide an adjustment of the questionnaire to suit the needs in meaning within the Luo language. As the pretest exercise progressed lexical ambiguities were realized in some translated questionnaire items. For example, the word "Nyamrerwa" was adopted as an equivalent of the "Bamako Initiative project". It was later discovered that the evolution in the usage of this lexical item had given it more than two meanings. The word Nyamrerwa could be used to refer to the community health workers within the B.I programme, nurses in general, personal doctor, health counsellor

or traditional birth attendants. There was also ambiguity in words such as that used to refer to a community project. That is, "chenro" which denotes organization, association or programme or group.

To resolve the problem of ambiguities, various approaches were used. In the first place, the investigator relied on synonymous paraphrases. This is based on the local speaker's knowledge that certain words mean the same as certain other words or phrases. The synonymous paraphrasing helped the investigator to discover the various meanings of certain words which guided his response expectations. This was more beneficial because there was no good Dholuo - English dictionary to be used in the field.

It was also important for the investigator to repeat pinpointing the intended meaning of a question, especially when a respondent seemed not to understand. In the same vein, the interpreter was also at times allowed to paraphrase (interpret) questions to make them clear. In sum, back translations during the pretest helped the researcher to refine the questionnaire. Through this method, the researcher was able to discover which part of the interview content would be successfully asked and what part of the research interests would be uncommunicable. The investigator gained the ability to detect errors made by the interpreters mainly through the back-translation technique. Key concepts in the original questionnaire were, therefore, adequately represented in the set of local language translations.



### 3.2.0 Sampling

Survey design was used in data collection because all the 18 clan-villages in Bar Chando sub-location were to be covered. The sampling unit was the household. Out of the 667 households, a sample of 150 (22.5%) households was arbitrarily taken for the study. The decision to use 150 households was partially influenced by the duration of the research which was about two months. With a sample of 150 households, an average of three households could be covered every day. The sample size was realized at the end of the fieldwork. From each household, only one adult respondent was interviewed.

Systematic sampling procedure was used in the selection of households. The sampling interval was 4. That is, if  $N = 667$  and  $n = 150$ , then  $K = 667/150 = 4$ . Since no listings of the households were available to provide a sampling frame, households were listed concurrently with the sampling. The first four houses surrounding the community pharmacy were assigned numbers on small pieces of paper. The numbers were mixed and the first household randomly picked from them. In the first household a female respondent was interviewed. Since the investigator had decided to interview an equal number of male and female respondents, a male respondent was interviewed from the fourth household. Thus a pattern was established whereby respondents were chosen from every fourth household alternatively with a gender bias. The questionnaires were administered to male or female household heads, mothers or any other adult (20 years and above) male or female member of the households visited. Where appointments were made for return visits, it was noted and such households were not included in the next day's sampling. The research considered only adult household members because

they are involved in decision-making at the household level. Apart from parents, other members aged 20 years and above were considered because in the rural setting, this is the age when people are recognized as independent decision makers in matters that may also affect other members of the household.

Before each interview, a brief introduction was made and translated to the respondent. The purpose of the research was explained and the reasons for wanting a given respondent elucidated. For any potential respondent, it was explained to him or her that the research was important for the improvement of health in the entire sub-location and other areas. It was also made clear to them that their answers and suggestions would be very valuable since not all people in the sub-location would be interviewed. To clear any suspicion the investigator always showed a research permit and assured the respondents that their answers would be confidential and that none of them would be victimised for their responses.

If it was difficult to find the desired respondent in a sampled household, the researcher proceeded to the next consecutive households until a respondent was found. In such a case, the sampling pattern was temporarily interrupted. However, the disruption was compensated for because in such situations, the beginning point for the next fourth sampling unit was the household where a respondent was found and interviewed, or where he or she gave an appointment. Only those households which fell within the sampling interval were listed down. The names of either the male or female heads of the households represented the households visited in the study. Compiling a comprehensive sampling frame would have been cumbersome due to the short duration of the fieldwork.



The investigator sampled with the help of the two interpreters. Each of the interpreters had a separate region they knew very well out of their primary and secondary school experiences. All clan-villages were covered systematically following a selected alignment of households. At the end of the fieldwork, a total of 200 households had been visited. These households included 150 households where interviews were successful and others where appointments failed, respondents refused to be interviewed or where the respondents were away in urban areas. In the sampling process, an equal number of male and female respondents was realized, that is, 75 men and 75 women.

### **3.2.1 Data Collection**

Data collection was done in two phases. The first phase was from 17th November to 16th December 1995, while the second phase was from 14th January to 16th February 1996. A total of 57 days were used for data collection.

The principal instrument for data collection was the questionnaire. It had both open-ended and close-ended questions. Open-ended questions generated qualitative data whose consistency was ensured through cross-checking questions. Supplementary questions were asked where further probing was needed and answers were recorded in a field notebook. On the other hand, close-ended questions were used to elicit quantitative data. Unstructured interviews were also used to generate qualitative data.

This strategy was utilised to acquire additional information that seemed not to come out through the standard questionnaire. The interviews were guided by a check-list of items that needed further elaboration from the respondents. This method was also used when there arose the need to alter the wording of some questionnaire items to suit the understanding of the respondents. It was in such a situation that the interpreter was

allowed to paraphrase (interpret) some questions and let the investigator know exactly what was being interpreted. However, as a general rule, all the questions were asked as they appeared on the English questionnaire then the Dholuo version was read. The responses were translated by the interpreter and recorded on the English questionnaires by the researcher. All the interviews were conducted face-to-face.

### **3.2.2 Group Discussion (In-Depth Group Interview) and Key Informants**

It was not possible to use the proposed focus group discussion (FGD) method. This was because the duration of the fieldwork did not allow the investigator to make adequate preparations to use this method. This method requires that the investigator should be an expert in the local language. Alternatively, more time would be required to train and teach a moderator who speaks the local language. Due to the investigator's superficial knowledge and competence in the Dholuo language, he could neither be a moderator nor could he use translators during focus group discussions. The use of translators would have interfered with the natural flow of the discussion and the data to be generated would be invalid. The FGD method was, therefore, replaced by key informant interviews and an unfocussed group discussion or in-depth group interview.

Key informants were selected purposively. The selection was based on the informants' positions in the community and the Bamako Initiative programme. They included the Assistant Chief, one women group Chairperson, three clan elders who were also members of the Village Health Committee (VHC), the divisional coordinator of the B.I and the community's B.I. chairman. One female teacher, who was also a member of the VHC, was included among the key informants. Additionally, a local medical practitioner and two herbalists were also interviewed as key informants. Five community

health workers, the B.I. treasurer, the resigned CHW and three male community members were chosen for the unfocussed group discussion. The languages used in the group discussion were English and Kiswahili since the participants and the investigator could easily communicate in these languages. The data collected from key informants and the group discussion were entirely qualitative. These data were recorded in a separate field note book and considered with the other already acquired qualitative information.

### **3.2.3 Non-participant observation**

Direct non-participant observation was also used. This technique generated more qualitative data. People's knowledge, perceptions of malaria and the use of the B.I. malaria control services could be inferred through observation. Some respondents voluntarily showed the medicines or the packets of the medicines they had recently bought from community health workers. The instructions stamped on the packets were read and where possible, the contents of the packets confirmed. In other cases mosquito nets could be seen and efforts toward environmental manipulation to control mosquitoes were observed. In some cases, if the respondents' claim of having a net was doubted, he or she was asked to show the investigator where it was. Further observations were made at the B.I. centre to confirm the use of the services, especially purchasing and dipping of the nets. Uncommunicated information was also elicited through observation.

For example, one could deny the use of traditional herbs yet some of the herbs could be seen in the house. The investigator assumed that the presence of herbs in the houses indicated a likelihood of their use. When the investigator was told the name of any herbal medicine or repellent, whenever possible, it was shown to him to confirm

whether it is what others had mentioned. The observation method was also supportive in ascertaining the real sociocultural context of the data generated.

#### **3.2.4 Data Analysis**

The questionnaires were pre-coded and post-coded to suit computer analysis within the Statistical Package for the Social Sciences (SPSS ). The investigator went through all the questions that were not pre-coded and appropriate numbers were written on all questionnaires. The answer categories for open-ended questions were determined by respondents. To code such answers, the researcher read all the respondents' answers to each open-ended question. Each time a new answer was met, it was recorded as well as the frequency of each answer category. After all the answer categories were known, appropriate codes were assigned. In case of multiple answers to a single variable, different code numbers were written for each combination of answers. A separate code book was created because most of the questions were either not pre-coded or open-ended.

Qualitative and quantitative data analysis procedures were adopted. Since the research was entirely descriptive, much of the data were subjected to descriptive analysis. There were univariate and bivariate analyses. Apart from frequency tables, cross-tabulations were done for selected variables from male and female respondents. The cross-tabulations enabled the researcher to attempt an analysis of the differences in knowledge and perceptions of malaria and use of the Bamako Initiative's Malaria Control services among men and women as well as to test the hypotheses.

### 3.3.0 Problems encountered in Sampling and Data Collection

Due to poor road networks, that were too muddy during the rains, it was not easy to reach some households. Walking from one clan-village to the other was also tiresome. The problem of access to households was partly resolved through the use of a bicycle on which the investigator and the interpreter rode. On the other hand, there was also the problem of hostile dogs that made entry in some homesteads difficult, unless their owners could be seen to help the researcher enter without being harmed. However, at one occasion, the researcher was not so lucky since he was bitten by a hostile dog. Thus, the researcher was required to spare sometime for about four days to complete anti-rabbies jabs in a medical clinic in Bondo Township.

Similarly, there were some problems in sampling. Since no list existed to be used as a sampling frame, the researcher listed only households visited. It was not easy to come up with a sampling frame since more time would be needed for the exercise. Given that in some areas households were scattered, determining the direction of the sampling so as to maintain the sampling interval was problematic. Sometimes it was difficult to identify the boundaries of Bar Chando sub-location from Ajigo or Abom sub-locations and the neighbouring Rarieda Division. This problem was alleviated through consultations with clan elders, the sub-chief of Bar Chando and constant confirmation with elderly residents of the area. The maps from the Central Bureau of Statistics (Map 3) and survey of Kenya (Map 5) were also helpful in the identification of divisional, locational and sub-location boundaries.

On the other hand, some respondents could hardly be found at home. In most cases, some houses were ever locked because the owners were engaged in some other

activities in shopping centres. Other houses did not have respondents because either the occupants were at the moment living in towns or they had died. If this was the case, the researcher proceeded in the same direction within a given clan-village until a respondent was found. This implied that the last household where a respondent was found became the starting point for the next systematic sampling procedure.

Also, there was the problem of interrupted interviews. When other people learned that the researcher was in the area, they were eager to know what was going on. Some of the villagers were enthusiastic to contribute to answering the questions. In such a case, the purpose of the research was explained and the curious villagers were requested to go back to their businesses and wait for their interview turns. In case another member of the family in the sampled household insisted on being present during the interview, he or she was requested not to help the other one since the researcher was only interested in views of the selected respondent.

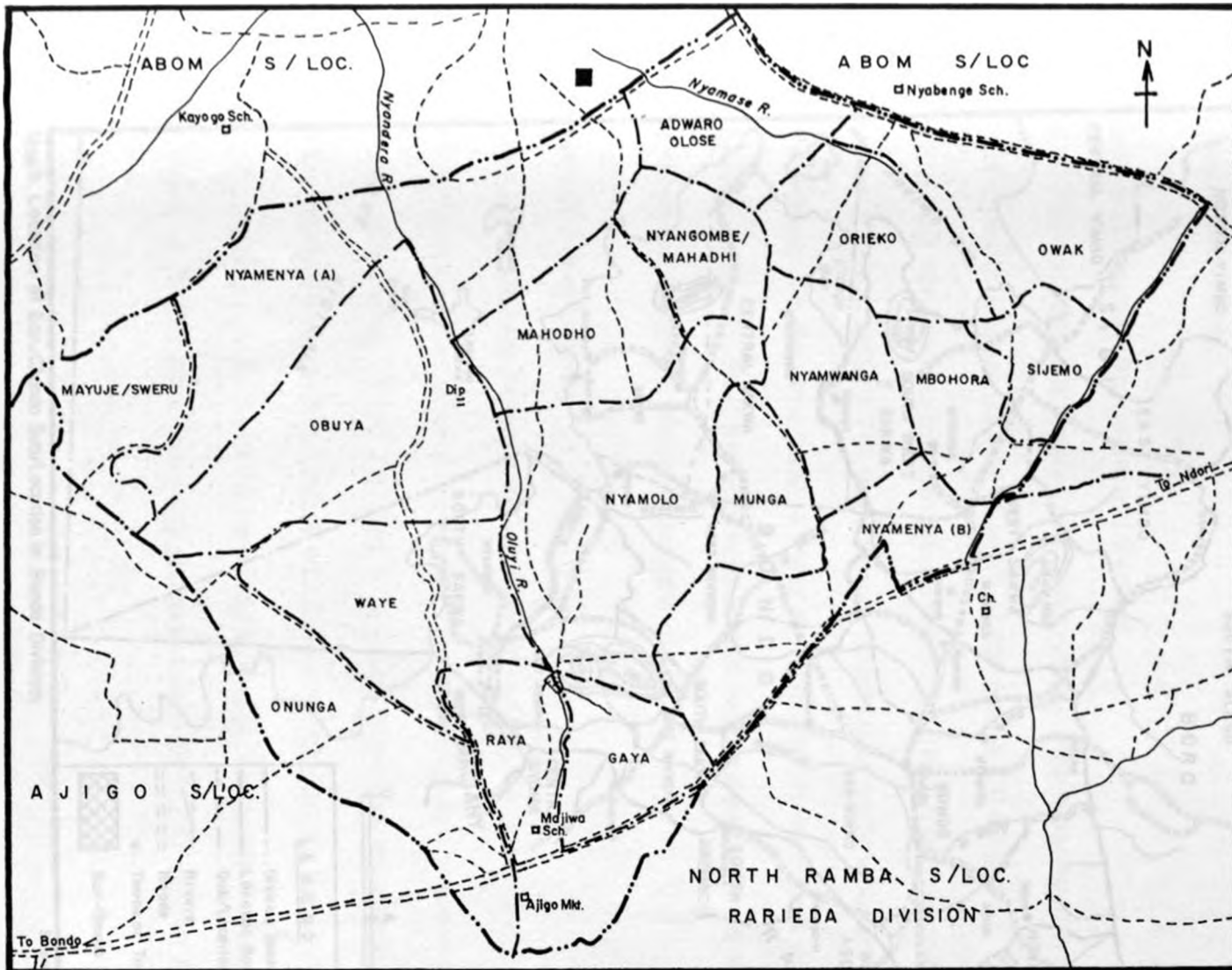
In some other cases, respondents from the sampled households said they were too busy to be interviewed. Whenever this happened the name of the respondent was written down for a return visit. The investigator also frequently attended the assistant chief's weekly baraza where the purpose of the research was further elaborated and clarified. Villagers who attended the baraza were from time to time urged to co-operate during interviews.

On the other hand, some respondents demanded for individual rewards after the interview. In such a case, it was explained to them that the research was to benefit the whole sub-location. The researcher reminded such people that their answers were very important because they would represent the views of many other people who would not

be interviewed. Similarly, some respondents were disappointed to learn that the investigator would not give free tablets and bednets after being interviewed. Some even requested the investigator to listen to their other health problems and tell them how to treat or manage them. To resolve the problem of the need for free drugs and nets, the researcher explained to the respondents that one of the goals of research was to find out the problems the local people encountered in acquiring these facilities from the established health programme. It was made clear to them that on the basis of their responses and suggestions, the health services in their area may be improved. The researcher relied very much on his basic health knowledge to answer some questions from the respondents. However, the respondents were made aware of the fact that the investigator would not answer some of their questions because biomedicine is not his area of specialisation.

In summary, this study combined quantitative and qualitative research methods. Quantitative data was collected from a household survey using a standard questionnaire. Qualitative data was collected through open-end questionnaire items, key informant and in depth group interviews, direct observation and unstructured interviews. A code book was created to facilitate univariate and bivariate analyses. Frequency distributions were used to describe the variables, while cross-tabulations and the chi-square were applied to test and assess the relationships between selected variables. Qualitative data analysis entailed the use of quotes and inferences from anecdotes and field observations. The working hypotheses in chapter two were heuristic devices through which we are attempting a holistic assessment of the impact of the Bamako Initiative Malaria Control component in a rural setting. Our findings are presented in the next chapter.





**LEGEND**

- Sub/Location Boundary
- - - Village Boundary
- Roads
- - - Tracks and Footpaths
- ~ Rivers
- Bar-Chando PHC Project/BI Centre
- Sch. School
- Ch. Church
- Mkt. Market

0 1 Km.

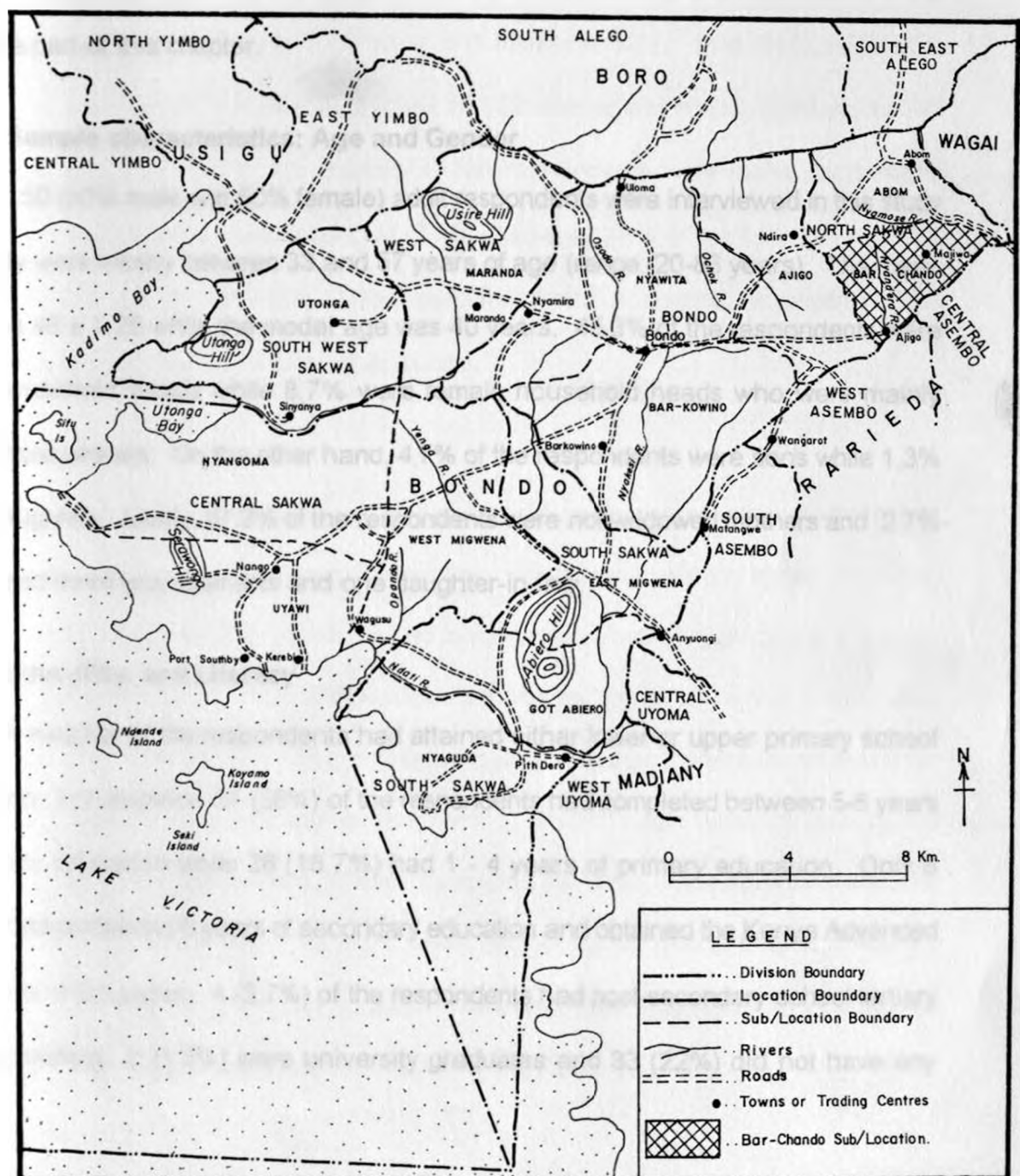
Map 4. Bar-Chando: Clan Villages and Bamako Initiative Centre.

Source: Modified from CBS, 1989.

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CHAPTER FOUR  
PRESENTATION OF RESEARCH FINDINGS



Map 5: Location of Bar-Chando Sub/Location in Bondo Division.

Source: Survey of Kenya

## CHAPTER FOUR

### PRESENTATION OF RESEARCH FINDINGS

#### 4.0 INTRODUCTION

Descriptive results are presented in the first part of this chapter. In the second part, cross-tabulations of selected variables are computed with reference to the objectives and hypotheses of the study. Also, the interpretations and explanation of the data are part of this chapter.

##### 4.1.1 Sample characteristics: Age and Gender

150 (50% male and 50% female) adult respondents were interviewed in this study and they were mostly between 33 and 57 years of age (range: 20-86 years). The mean age was  $48 \pm 1.25$  while the modal age was 40 years. 45.3% of the respondents were male household heads while 8.7% were female household heads who were mainly uninherited widows. On the other hand, 4.7% of the respondents were sons while 1.3% were daughters. Lastly, 37.3% of the respondents were non-widowed mothers and 2.7% comprised three grandparents and one daughter-in-law.

##### 4.1.2 Education and Literacy

A majority of the respondents had attained either lower or upper primary school education. For instance, 57 (38%) of the respondents had completed between 5-8 years of primary education while 28 (18.7%) had 1 - 4 years of primary education. Only 8 (5.3%) had completed 6 years of secondary education and obtained the Kenya Advanced Certificate of Education. 4 (2.7%) of the respondents had post-secondary school tertiary college training, 2 (1.3%) were university graduates and 33 (22%) did not have any

formal education. Therefore, these data show that most of these respondents were literate although 48 (32%) of the respondents were considered illiterate because they stated that they could neither read nor write. Conversely, 29 (19.3%) of the respondents could read and write in Dholuo while 11 (7.3%) could read and write both in Dholuo and English. On the other hand, 40 (26.7%) of the respondents said that they could read and write in Dholuo, English and Kiswahili languages. 21(14%) of the respondents indicated that they could read and write in Dholuo and Kiswahili only. One Agikuyu female respondent was literate in Kiswahili, English and Dholuo as well as her Agikuyu mother tongue. It was observed that a majority of the respondents were more comfortable speaking in their Dholuo mother tongue. This was regardless of the fact that some of them knew English and Kiswahili. This implies that health education information in the area should largely be in the Dholuo language.

#### **4.1.3 Occupation**

The Luo of Bar Chando sub-location are mostly subsistence farmers with 70% of them mainly engaged in food crop production. They grow maize, millet, cassava, bananas and sweet potatoes. There was no large-scale commercial farming in the area. Most people who had coffee had abandoned it probably due to the lack of cooperative societies to help the farmers market their products. However, there is potential for horticultural production, especially tomato farming. There is also livestock rearing and the animals reared include cattle, sheep, goats and donkeys. Livestock is reared for their domestic products such as milk, beef and dung for manure and smearing (plastering) the floors and walls of houses. The donkeys are mainly used as a means of transport and at times they are used together with bulls for ploughing. A few of the

people in Bar Chando sub-location do dairy farming on a small scale. There is also a potential for sisal growing. 18 (12%) of the respondents were in salaried employment, a majority of whom were teachers and technicians while 6.7% combined subsistence farming with petty business. Most of those in petty business sold bananas, pawpaws, tomatoes, fish and vegetables. Some people weaved ropes from sisal that is grown in many parts of the sub-location. 8.7% of the respondents were casual labourers employed as semi-skilled workers in carpentry, masonry, painting and bicycle repair while 2.7% of the respondents could be described as businessmen since they owned shops in the nearby market centres.

There is potential for zero-grazing in the sub-location especially for the people who have settled near the two river streams (see Map 4). One resident of the sub-location, who had donated a building to serve as a community pharmacy had succeeded in dairy farming while another was successful in rearing grade cattle through zero-grazing.

#### **4.1.4 Household size**

In this study, the number of both consanguinal and affinal relatives as well as non-kin residents in a household comprised a household size. Married daughters and sons were not considered in a household size. This study showed that the range of the household size was 1-15 members and the modal size was 6. This distribution of household sizes is typical of other areas in Bondo division which mostly have polygynous families (Assistant Chief: Personal Communication). It is conceptualized in this study that the household size would influence the use of the Bamako Initiative services because in the face of meagre incomes, many residents of Bar Chando sub-location were pre-occupied with feeding their families.

#### 4.2.0 Knowledge of malaria, its causality and transmission

Most of these respondents were aware of malaria as a disease. However, the respondents showed some confusion about its causality and transmission. For example, 49.3% of the respondents knew that malaria was the most serious disease in the area. To some respondents, this disease was thought to be serious because it could lead to the death, especially, of children. For other respondents, malaria was more serious during the wet season only. This is a time when many people complain of being sick to the extent that they do not do any work. However, some respondents did not mention malaria as the most serious disease in the area.

The respondents gave seven local names for malaria. For instance, 45% mentioned the name midhusi (also called mudhusu or midhusu). Typically, midhusi was associated with shivering (tetni), fever, dullness and the vomiting of bile. According to 6.7% of the respondents, midhusi usually occur following the consumption of fresh farm products such as green maize as well as food prepared from fresh grain harvests, for instance, millet and sorghum. In fact, it was stated that malaria is normally prevalent during the planting and harvesting seasons. However, two key informants stated that midhusi also referred to nose bleeding while 25% of the respondents gave the headache (locally called wichbar) as the other local name for malaria. 3.3% of the respondents stated that homa was the local name for malaria. However, this term has been borrowed from the Kiswahili language and it refers to any kind of febrile illness accompanied by colds, flu, fever, loss of appetite and headache. In Kiswahili, malaria is usually differentiated from the other febrile illness by using the prefix "homa ya", thus, homa ya malaria. To 2% of the respondents, woyo is the local name for malaria, although blek

and nyal diema were also mentioned by one respondent. Informal interviews revealed that nyal diema was actually the local name for cholera while woyo refers to metabolic disorders. Therefore, it was likely that malaria could easily be confused with the other illnesses. For instance, malaria and other illnesses such as diarrhoea (diep) and colds (homa/athung'a) are associated with feverish conditions. In this sense the local people may seek help for the other illness and yet it could actually be malaria. Key informants indicated that convulsions, especially in children were mainly associated with worms (Kute) which are said enter and mature in the child's head. If the child is not treated in time by dropping a concoction of okita (*Ocimum Kilimandscharicum*) in his/her nose, the worm would cause madness (neko). Convulsions (Sambwa) were also attributed to punishment from ancestors or witchcraft. However, given the little knowledge of malaria, the local people would probably fail to associate convulsions with the disease. 22.7% of the respondents said that malaria was simply known as maleria. This is probably an indicator that these people are internalizing the knowledge of malaria from the biomedical point of view to the extent of using the clinical name of the disease. The conceptualization of this disease by its western medical term could be attributed to either long experience with the disease and radio advertisements or the presence of malaria control programmes in the area.

On malaria causality, only 38% of the respondents seemed to know the role of the mosquito. The respondents who confirmed that mosquitoes transmitted malaria also seemed to know that not all mosquitoes transmitted the disease. These respondents stated that the "bigger mosquitoes" were harmless although their bites were a nuisance. 23.3% of the respondents argued that malaria is transmitted from a sick person through

breath (muya). To the other respondents (3.3%), the transmission of malaria was associated with both mosquitoes and breathing contaminated air. Mosquito bites, sharing utensils and blankets were regarded as the causes of malaria by 1.3% of the respondents. 9 (6%) of the respondents attributed malaria transmission to only sharing utensils such as cups, plates, spoons and calabashes. Others argued that they would contract malaria if they shared clothes and beddings. It was noted that some people perceived malaria to be similar to other diseases such as epilepsy (ndulume) and elephantiasis (tielo mokuot) which are commonly referred to as "blood diseases" as these are transmitted along family lines.

The other respondents mentioned other factors in malaria causality such as houseflies and foul air from streams or a combination of such factors and the mosquito. 15.3% of the respondents argued that cold cause malaria. Causality by cold was explained in terms of changes in bodily temperatures, being rained on, walking in early morning dew and eating cold food. 12.7% of the respondents gave a combination of mosquitoes and the use of dirty water as factors in malaria causality. Most of those who mentioned dirty water argued that boiled, tap or rain water would alleviate the malaria situation. Some respondents regarded stomachaches and diarrhoea as malaria resulting from the use of contaminated water. Similarly, 4.7% of the respondents attributed malaria causality to the use of dirty water acquired from ponds and unclean streams. On the other hand, 3(2%) of the respondents stated that poorly prepared food cause malaria although other respondents argued that children and teenagers were more prone to malaria because they liked chewing maize and millet stalks. Other factors which were associated with malaria causality and which were given by 3.3% of the respondents



included tsetse fly bites, eating too much white ants, dirty utensils and performing heavy tasks. However, 21(14%) of the respondents did not know the cause of malaria.

The respondents could remember an illness episode which they believed was malaria. However, only 45% of them mentioned the clinical symptoms of malaria which included shivering, headache, fever and increase in body temperatures (de/ maowore/ma chwakore), loss of appetite, joint pains, nausea and vomiting of bile. 37.3% of the respondents mentioned non-malaria symptoms as indicators that the last illness they were referring to was malaria. The biocultural malaria symptoms mentioned included body itching, stomach problems, diarrhoea, coughing, paining tongue, impaired vision, reddish eyes, cold rash, yellowish urine, cold fingers and nose bleeding.

This finding indicates that some local people did not have clear information about the signs and symptoms of malaria. A lack of such knowledge would negatively affect self-diagnosis and treatment using the available medicines. Interestingly, only 12% of the respondents pointed out that they knew that the last illness they were referring to was malaria through diagnosis at health centres and only 1.3% of the respondents had been examined by a local medical practitioner. While 4% of the respondents observed that their family members and friends made them to know that they were suffering from malaria, another 2% of the respondents confirmed that the illness they referred to was malaria after getting relief through the use of malaria medicines.

The respondents showed a high knowledge of anti-malaria medicines. For instance, 63.3% of the respondents had used conventional malaria medicines such as chloroquine, malarquin, fansidar, maladrin and quinine to treat their last malaria illness. This knowledge and the use of anti-malaria tablets is, perhaps, a result of a long

experience with the use of over-the-counter drugs.

13% of the respondents used non-malaria drugs such as aspirin, actal, hedex, aspro, dawanol and indocid to treat what they referred to as their last malaria illness. It was noted that these medicines were used to ease either clinical malaria symptoms, such as fevers and headaches or traditional malaria-associated symptoms, for instance, stomachaches. On the other hand, 4% of the respondents indicated that they had used herbal medicines to treat their last malaria attack. The key informants asserted that some people normally mix herbal remedies with tablets to make them more effective against malaria. Similarly, some respondents stated that they used assorted, unprescribed tablets at the same time for a faster cure. One respondent affirmed that he used a combination of capsules, panadols and a herb called oluoro-chieng (*Ageratum conyzoides*). However, 13% of the respondents could not remember the names of the drugs they were given at the health centres or shops during their last malaria illness and 3.3% of the respondents did not seek treatment.

The data indicate that the existing malaria control measures under the Bamako Initiative were inadequate in educating the people about the disease and effecting the global goal of prompt diagnosis and treatment. However, it was observed that although the weekly sub-locational baraza (public meetings) were poorly attended, they were the main venues for most of the primary health care education.

#### 4.2.1 Knowledge and perceptions of the Bamako Initiative Malaria Control Programme.

The study revealed that the community sensitization about the Bamako Initiative programme was inadequate. For instance, 35.3% of the respondents did not know that there was a malaria control programme in the area. It was noted that members of clan-villages such as *Sweru, Onunga, Mahudhu* and *Mbohora* which were a long distance approximately 3.5 kilometres each, away from the community pharmacy, (see Map 4) did not know the exact role of the Bamako Initiative in malaria control. In fact, only 8.7% of the respondents knew the Bamako Initiative by name. A majority of the respondents (54%) knew the Bamako Initiative as the Nyamrerwa Project while 4.7% of the respondents knew it as the primary health care project. It was noted that the basic principles of the Bamako Initiative approach to malaria control and health care in general were not well understood. There was also the confusion arising from using the term nyamrerwa to refer to the Bamako Initiative programme. Since the term nyamrerwa refers to the Traditional Birth Attendants (TBAs) some people could not perceive how the CHWs and their nyamrerwa project could be involved in other health issues such as malaria control. Key informants indicated that that TBAs traditionally served as traditional midwives, obstetricians, gynaecologists and paediatricians. One community health worker pointed out that the phrase "*nyamrerwa otiyo tich mokik*" (the CHW performs multiple duties) was popularly used to convince the people of the diversified roles of the CHWs which now include malaria control and management. The people who knew the Bamako Initiative by the name nyamrerwa had a vague knowledge of the new roles of the TBAs (CHWs) serving in the Bamako Initiative programme. Those who

mentioned the PHC, nyamrerwa and the Bamako Initiative were considered to be aware of the Bamako Initiative programme. On the other hand, there were respondents who knew the nyamrerwa as individual TBAs or nurses without any association to the community-based health project. Such people were considered to be unaware of the Bamako Initiative approach to malaria control. In general it was observed that the B.I. was perceived as the programme for CHWs (Nyamrerwa).

The three major malaria control activities of the Bamako Initiative, that is, the selling of bed nets, medicine and the dissemination of health education messages were articulated by only 14.7% of the respondents. Observations in the field revealed that diagnosis of malaria was not part of the Bamako Initiative activities. Similarly, there were no prescription guidelines for the sell of chloroquine. The CHWs sold tablets on the basis of how many their clients were able to buy. Similarly, there were no referral systems backing the Bamako Initiative approach to malaria control in Bar Chando sub-location. 38% of the respondents associated the Bamako Initiative with the sell of medicines only. The key informants revealed that the Bamako Initiative programme was perceived as a profit making organization due to the CHWs' distinct role of selling drugs. This study reveals that the community members do not rely on the CHWs for chloroquine supply because the CHWs insisted on cash sale even when one was too sick. On the other hand, as soon as the people learnt that some of the Bamako Initiative drugs had expired, they became skeptical. The data further indicate that prevention, which is an important component of malaria control, was not emphasized within the Bamako Initiative activities. The majority of the respondents (71.3%) however, did not favour the use of anti-malaria medicines for prevention. The negative attitude to

prophylaxis could be attributed to the lack of knowledge about the advantages of prophylaxis. On the other hand, most of the respondents felt that taking medicines before the manifestation of an illness would make the disease resistant. This implies that the curative approach to malaria parasite control was encouraged at the expense of the preventive use of drugs which is also a relevant measure in holoendemic malaria areas such as the study district (see Map 1 & 2).

Community education on malaria control had been organized neither previously nor during the field-work. The study revealed that there was a low commitment to community education about malaria control. Only 36.7% of the respondents stated that they had heard or seen information on malaria control. According to the data, only 3.3% of the respondents heard the information from the CHWs, 11.3% got the information from medical (health) officers in health centres while 7.3% got the information through radio advertising. 6% of the respondents had read about malaria while 5.3% knew about it in schools. Four percent of the respondents mentioned other sources of information to include researchers in a neighbouring division of Asembo, weekly barazas and a community health worker seminar.

No community health worker sold mosquito nets. The sale of bed nets was centralized at the community pharmacy which was also the B.I. centre (see Map 4). Only 12.7% of the respondents were aware that the Bamako Initiative was involved in the sell of bed nets while 2% of the respondents were not sure of the actual activities of the Bamako Initiative. However, nearly everyone in the sample (97.3%) was aware of the use of bed nets. 1.3% of the respondents said that bed nets also protected users against tsetse flies while 37.3% of the respondents did not know whether bed nets should be

dipped in an insecticide or not. On the other hand, 6.7% of the respondents felt that there was no need for dipping the nets in an insecticide. However, most of the people who affirmed the need to dip the nets also knew that the dipping was the responsibility of the CHWs.

A majority of the respondents (64.7%) were of the opinion that everybody in the family equally needed bed nets. However, due to their low incomes and large families, the purchase of bed nets was perceived as quite expensive. Other respondents seemed to know that preference should be given to children and women in terms of protection against malaria. The respondents held that women and children needed nets most as follows:- children (16.7%); children and pregnant women (5.3%); women (2%); while 2.7% of the respondents recommended nets for both pregnant and non-pregnant women.

The perception that women and children needed the nets most was supported by the view that women and children were most vulnerable to malaria. Coincidentally, these notions are consistent with the overall objective of the B.I. That is, reducing infant, child and maternal morbidity and mortality by improving their accessibility to primary health care. In this regard, one male respondent said:

*"Ned suna onego nyithindo kod mon mapek tigo nikech nyithindo gi mon nigi remo mayot ma malaria nyalo hinyo kendo be mon mapek nyalo tho".*

(Mosquito nets should be used by children and pregnant women because children and women have light blood that is easily affected by malaria and the pregnant woman may die).

Another female respondent who perceived the need for everybody to have the nets but was in a dilemma due to lack of money observed:

*"Nedno to bende ober abera gi ji duto nikech suna bende kayo ji duto mak mana ni pesa ema otamo ji"*

(The net is just good for everybody because mosquitoes also bite everybody only that money is what the people are unable to get).

When asked about the household needs that could hinder the respondents from buying bed nets, 20(13.3%) of them mentioned food while 20(13.3%) indicated both the need for food and school fees. Other school requirements such as stationary, textbooks, uniform and building funds were also mentioned by most respondents. On the other hand, 20 (13.3%) of the respondents mentioned food and clothing as the basic needs that would prevent them from acquiring bed nets. To 31 (20.7%) of the respondents, food and other basic household requirements such as paraffin, salt, tea, utensils and beddings would similarly hinder the purchase of bed nets. While 3 (2%) of the respondents gave a combination of school fees and basic household requirements as barriers to the purchase of nets, 9(6%) mentioned a combination of fees, food and basic household requirements. 12(8%) of the respondents stated that their purchase of nets would be hindered by the needs for food and medicine. Interestingly, the 15(10%) of the respondents who perceived no domestic need that would bar the purchase of nets were from households with 1-3 members. On the other hand, it was observed that in most households, there was a likelihood of sharing prescribed and unprescribed medicines due to lack of money to buy medicines for each family member who was ill.

These data clearly indicate that most of the people in the study area were generally preoccupied with fending for their families especially looking for food, therefore, this was likely to be given priority over the purchase of bed nets. The data also imply that due to the lack of money to buy nets for everybody, the people of Bar Chando sub-location were relatively unable to use the B.I bed net services consistently. In fact, the Bamako Initiative programme needs to encourage selective malaria control measures



so that priority is given to vulnerable groups in the households.

Most of the respondents (63.4%) perceived the rain season as the most appropriate period to use bed nets although 32.4% perceived the need to use the nets during both the rain and dry seasons. Those who associated bed net use with rain seasons argued that this was the time when there were many mosquitoes. Some respondents stated that during the dry seasons, the nights were hotter and there would be a lot of discomfort to use bed nets.

Although, a majority of the respondents (84%) perceived no problems in using bed nets, a few of them pointed out the following problems: tedious washing of smoke and soot-stained nets (2%); difficulties in tacking the nets due to small sizes (2.7%); discomfort arising from the use of nets in humid seasons (4.7%) and contracting malaria even after using the nets (2.7%). Furthermore, there was a tendency for some people to have little understanding of the relationship between the protection against mosquitoes and malaria prevention through the use of bed nets. Similarly, 16.7% of the respondents held that bed nets did not protect against malaria, but only against mosquito bites. One male respondent disputed the fact that bed nets protect users against malaria by observing that: "people are not always under the nets, anyway."

52% of the respondents were more likely to be committed to the instructions on drug use. However, 37.3% of them indicated that they stopped using drugs immediately they started feeling well. These respondents either kept the remaining drugs for the next illness or disliked the bitter and unpleasant taste of the tablets. Some of the respondents stopped taking the drugs after consideration that taking medicines when one is well makes the disease resistant. Observation and informal interviews revealed that family

members and friends would preserve medicines for each other to be used for future self-medication. These data clearly indicate an important area that has not been adequately addressed by the Bamako Initiative programme. The control of malaria would require that everyone understand the need to complete the course of treatment and use anti-malaria drugs correctly.

Perceived unequal access to the benefits of the Bamako Initiative's services negatively influenced the community participation and identification with the programme. This is because, of those who knew about the Bamako Initiative, only 14% of them felt that the Bamako Initiative programme benefited everyone. A majority of the respondents (40.7%) observed that not everyone in Bar Chando sub-location benefited from the Initiative while 12.7% of the respondents were not sure whether the Bamako Initiative benefited everyone or not. These respondents supported their views by the following reasons:

- (a) that not everyone could afford the nets and drugs;
- (b) that not everyone was aware of the programme;
- (c) that there was a lack of equal access to the services;
- (d) that some people doubted the ability of the CHWs while some of the CHWs had negative attitudes towards some of their clients.

#### **4.2.2 Utilization of the Bamako Initiative Services**

The local people relied more on over-the-counter malaria treatment drugs than those distributed by the Bamako Initiative programme. Chloroquine, bed nets and other tablets were acquired from the local shops and other sources (see Table 4.15). 53.3% of the respondents had never used bed nets. Only 10.7% of the respondents had bought their nets from the Bamako Initiative programme while 30.7% of them bought the nets from shops. In most of these cases, the B.I. found the people already using the nets.

On the other hand, some respondents could not buy the nets from the B.I. because the sell of nets was centralized at the B.I. centre which was perceived to be far from most of the respondents. Conversely, 4% of the respondents had acquired bednets from hawkers in Kisumu town and 2.7% of the respondents had been given nets either by relatives or the Bamako Initiative programme as an incentive to them as CHWs. The people who had nets were reluctant to take their nets for re-dipping at a fee of Kshs. 30/=. Some of the respondents who had used the nets had discarded them because they were torn. At the beginning of the fieldwork, only 150 bed nets out of 450 had been bought from the community pharmacy. The bed-nets initially costed Kshs. 250/= but had been reduced to Kshs. 220/= and yet most people still could not afford to buy them. Although the B.I. programme nets were heavily subsidized, most of the respondents, still found the prices unaffordable. In Kisumu, the market price for a single bed costed between Kshs.700 – 1000 while the mosquito nets such beds costed Kshs.350/=.

According to this study, a majority of the local people were willing to pay for the Bamako Initiative services. For example, 42% of the respondents who supported payment for the services observed that funds were needed to purchase more drugs and nets for B.I. programme. These same respondents felt that the payments would help in the provision of incentives for the VHC and CHWs. They further held the view that health facilities cannot be acquired freely in the modern economies. 24% of the respondents did not support payment for health services provided under the Bamako Initiative because of the belief that the bed nets and drugs were offered by UNICEF and other donors to help the rural poor. The data from our group discussion revealed that some community members expected to be given free nets because some CHWs did not

pay for them when the B.I. was introduced. At the beginning of the programme, a few CHWs were given free mosquito nets to motivate them in voluntary work. This gesture also negatively influenced the participation of CHWs who were not given the incentive.

In this sense, some of the residents of Bar Chando probably viewed the B.I. approach as being irrelevant to their own basic needs and concerns. Some respondents further argued that the government should provide free health services whose costs should be offset through taxes levied on the people who are formally employed. Key informants revealed that the preoccupation of the community health workers with the sell of drugs was thought to be a move to make profits out of donated facilities, while some of the other people claimed that the medicines distributed under the Bamako Initiative were sold cheaply because they had expired and had low efficacy.

A majority of the respondents (38.7%) attributed the non-use of bed nets to the lack of money but 6.7% felt that there was no need to buy mosquito nets since they had more pressing needs than the nets. One male respondent commented:

*"ok anyal nyiewo ned suna nikech ok anyal weyo chiemo to anyiewo ned mar suna"*

(I cannot buy a mosquito net because I cannot leave food to buy a mosquito net).

One respondent claimed that the nets were too expensive while another one feared the discomfort of using the nets. While 3.3% of the respondents did not know where to get the nets, 2.7% of them stated they had alternatives such as insecticide sprays and mosquito coils. Perhaps, the residents of Bar Chando sub-location were not committed to using the Bamako Initiative services. During their last malaria illness, the respondents acquired their medicine as follows:- from shops (44.7%), local medical

practitioners (10%), health centres (25%), herbal remedies (3.3%), cure through prayers (2%), and from local sellers (1%). Only 8.7% of the respondents bought their medicine from the Bamako Initiative programme through CHWs, while 1.3% of them bought medicine from both the CHWs and shops. Similarly, of those who had used chloroquine before, a majority (47.3%) bought it from local shops while 20.7% acquired chloroquine from the Bamako Initiative programme. It was observed that some people in Bar Chando sub-location had access to chloroquine sold by CHWs from a health centre in a neighbouring division (20%), private seller (4.7%) and local medical practitioner (3.3%).

The data indicate the respondents' use of the Bamako Initiative services as follows: sometimes (40.7%), most of the time (12%), always (8%) and never used (38.7%). The respondents who said that they sometimes used the B.I. services implied having bought medicines from CHWs at least once in a month. In this study, "most of the time" implied using the services twice in a fortnight. The respondents who stated that they always benefited from the B.I. services were those who lived close to either the community pharmacy or CHWs. In this sense, there was daily interaction with either CHWs or VHC members. The major reason given by those who had never used the Bamako Initiative services was lack of awareness of the programme. Other respondents claimed that since they were employed away from home, they could not use the Bamako Initiative services. On the other hand, lack of confidence in the efficacy of the Bamako Initiative drugs and the efficiency of CHWs led to the low utilization of the services. Furthermore, some respondents were discouraged by the absence of a variety of drugs within the Bamako Initiative programme. It was also observed that the distance of the community pharmacy discouraged other people from participating in malaria control

activities. When asked what exactly hindered the use of the Bamako Initiative services, one key informant asserted:

*"ok ang'eyo nikech wach mar pharmacy k'Olum noni e Abom sub-location, Koro wan ok wanyal yudo kony go"*

(I do not know because the issue to do with the pharmacy at Olum's home is in Abom sub-location so we can not get that help).

Due to the long distance of the Bamako Initiative centre from some clan villages and households, some respondents felt that the B.I. programme was not even in their own sub-location. Indeed, the community pharmacy which also served as the B.I centre was located in Abom sub-location, a few metres from its boundary with Bar Chando sub-location (see Map 4). Furthermore, over half (53.3%) of the respondents claimed that they had never met the CHWs.

#### **4.2.3 Malaria control and Ethnomedical Practices in Bar Chando sub-location**

In general, the Luo traditional malaria medicines comprise what is commonly referred to as yiend makech (bitter medicines). 47 (31.3%) of the respondents affirmed that there were traditional medicines for malaria control, although 10% of the respondents said that they did not know if such medicines existed. One respondent declined to elaborate on her knowledge of traditional medicines claiming that traditional healing practices had been abolished by the government. The data show that there are different varieties of local resources used in the treatment of malaria associated illnesses. Over 40 names of herbal plants used in malaria treatment and mosquito repelling were compiled from the respondents and key informants (Appendices D and E).

Out of the 47 respondents who agreed that traditional malaria medicines existed, 18 (38%) referred to concoctions of pounded leaves (yadh asuaga) which would be

rubbed on the forehead to ease malaria associated headaches. The herbs could also be crushed, mixed with water and taken orally as medicines which people drink (yadh abuda). 8 (17%) of the respondents described barks and roots which would be boiled in a pot (yadh agulu/achwaka) and the patient treated through steam inhalation (fundo/humo) under a blanket. A key informant indicated that Vicks Vapour rub balm would be mixed with the herbs for steam inhalation and 8% of the respondents gave a description of the use of assorted herbal medicines. 6 (12.8%) of these respondents did not disclose the names and descriptions of the use of the herbs they knew. More descriptions of traditional malaria treatment methods were given by key informants and it is clear from the data that a majority of the respondents had used traditional medicines for other illnesses that were not necessarily malaria. These respondents had used ethnomedical remedies as follows: Once (11%); sometimes (49%); always (16%) and never (18%). Interestingly, only 6% of the respondents found it necessary to consult a traditional medicineman when malaria attacked. Most of the respondents argued that medicinemen were unable to diagnose and treat malaria. However, 14% of the respondents observed that medicinemen would be consulted only if the cause of the disease was doubted. On the other hand, some respondents (5.3%) believed that there was a type of malaria that could not be treated by modern medicine. It was, for instance, pointed out that if malaria recurred then it ceased to be the general type manifested by fevers, hence, could not be treated by conventional drugs. 2.7% of the respondents pointed out that there was a need to pray rather than go to traditional healers or modern health facilities. These data, therefore, indicate that in treating malaria with traditional medicines the local people did not seek specialized ethnomedical advice.



The study reveals that there are no elaborate rituals associated with malaria treatment. Indeed, only 8.7% of the respondents stated that there were such rituals and described the bleeding of impure blood through forehead incisions which were generally believed to ease headaches. One respondent indicated that a ritual called Loko-ndaqla could be used to cure malaria. In this ritual, sacrifices and spells are used to combat or 'tie' (Loko) the effect of evil charms of the sorcerer (jandaqla). This indicates that there may be a tendency to explain malaria in terms of human causes. 3(2%) of the respondents observed that a ritual called nyawawa protects participants from misfortunes which include malaria. Nyawawa, is carried out at the end of the year and it entails spontaneous noise to cast spirits of misfortune to the lake. Only 23% of the respondents believed that prayers would heal malaria illness while 2.5% of them did not know whether malaria could be treated through prayers. Key informant data indicated that malaria was sometimes associated with evil spirits especially when it led to child convulsions (sambwa) and mental instability or madness (neko), which are perhaps cases of cerebral malaria. In such cases, prayers were believed to give relief. This implies that, to some extent, malaria was associated with supernatural causality, thus, curers with supernatural powers would be sought.

Some respondents reported the use of local beers such as chang'aa and busaa as a remedy and protection against malaria. Those who took these local beers were convinced that it protected them against malaria and other illnesses. One male respondent asserted:

*"Ne atemo tiyo gi malaraquin gi panadol ok aneno kagi thiedha, to ka ne adhi ang'ewo chang'aa glas ariyo, to ne aneno ka othiedha ma nyaka sani poko duogo"*

(When I tried to use malariaquin and panadol I did not see them treating me, but when I bought two glasses of chang'aa it treated me till now it (malaria) has not recurred).

In this study, the use of traditional liquor was considered an ethnomedical practice which would compete with conventional malaria control measures. One male respondent stated that he mixed herbal medicines with the busaa beer for effective treatment of fever and colds. The belief that traditional liquor treated or protected one from malaria was confirmed by all the key informants interviewed. On the other hand, one female respondent claimed that:

*"kong'o ema geng'o maleria kendo chiemo maber ema konyo geng'o maleria... chang'aa ema ka amodho to awinja ka koyo orumo kendo maleria ok maka"*  
(It is liquor which protects (me from) malaria also good food helps me to prevent malaria..... When I take chang'aa cold disappears and malaria does not attack me).

The study also revealed that there are various traditional ways used to keep mosquitoes away. These methods included the use of herbal repellents, smoke and burning cow-dung (Appendix E). These ethnomedical mosquito control methods are among the non-commercial mosquito control methods mentioned by the respondents (Table 4.1). These methods are used as alternatives to modern mosquito control methods or as substitutes, for those who could not afford bed nets and other modern methods.

**Table 4.1 Non-commercial ways of controlling mosquitoes**

METHOD	FREQUENCY	PERCENTAGE
Herbal repellents	44	29.3
Smoke	15	10.0
Cow-dung	3	2.0
Cow-dung and Herbs	14	9.3
Environment manipulation	17	11.3
Environmental manipulation and herbs	21	14.0
Environmental manipulation, herbs and cow-dung	4	2.7
Do not know	29	19.3
*Other	3	2.0
<b>TOTAL</b>	<b>150</b>	<b>100</b>

\*Use piece of cloth to chase mosquitoes; leaving the lantern on at night.

#### 4.2.4 Cross tabulations and hypotheses testing

Significance tests were employed to evaluate the relationships between variables in selected the cross-tabulations. The 0.05 level of confidence was used in testing the hypotheses stated in Chapter two. A calculated chi-square ( $X^2$ ) value that equals or is less than the tabulated (critical Chi-square or  $X^2_{0.95}$ ) value does not attain significance in which case the null-hypotheses ( $H_0$ ) is rejected. A calculated chi-square value exceeding the tabulated value attains significance whereby the alternative Hypothesis ( $H_1$ ) is accepted and the null-hypotheses rejected. The four hypotheses formulated in Chapter two were tested by this criterion. The tests were further supported by an attempt to discuss the hypotheses using inferences from the descriptive results. Only a few variables yielded significant association with gender.

The variables gender by issues discussed by CHWs did not attain a significant association at 0.05 level of significance (Table 4.2). However the data reveals that men

were given malaria control Information more than women. On the other hand, women were more likely than men to report having discussed sanitation and hygiene with the CHWs. Conversely, there was no difference between men and women in terms of access to community health workers.

**Table 4.2 Gender by health issues discussed by CHWs**

Issues discussed by CHWs	N/a	Sanitation & hygiene	Malaria control	Need for ready medicines	Other*	ROW Total
Gender						
Men	9 (52.9)	37 (46.3)	13 (59.1)	7 (50)	9 (52.9)	75 (50)
Women	8 (47.1)	43 (53.8)	9 (40.9)	7 (50)	8 (47.1)	75 (50)
Column Total	17 (11.3)	80 (53.3)	22 (14.7)	14 (9.3)	17 (11.3)	150 (100)

(The figures in paratheses are column percentages)

\* AIDS control, family planning child care and control of amoebic dysentery.

$X^2$  cal. = 1.295

DF = 4

CONT.COEFF. 0.0926

Critical value of  $X^2$  = 9.488 0.05 level of significance.

Significance: 0.8622

The study indicates that the people of Bar Chando sub-location had not clearly understood their role in sustaining the Bamako Initiative programme. It was observed that there was either a low turn-up of the village health committee members in their meetings or a cancellation of such meetings. This implies that, the VHC has not been an effective mechanism for stimulating community participation in malaria control. On the other hand, the community health workers expected monetary rewards while, at least, two of them had dropped out due to lack of incentives. Similarly, only 10% of the respondents seemed aware that the Bamako Initiative programme should be sustained by the community through a revolving fund set up from the bed net and drug sales. 15%

of the respondents did not know who should replenish the community pharmacy or sustain the Bamako Initiative project. To 28.7% of the respondents, it was the duty of the government and other donors to sustain the Bamako Initiative project. 11% of the respondents held that the sustenance of the Bamako Initiative project was the responsibility of the UNICEF and other NGO's, while 2(1.3%) of the respondents thought that the Bamako Initiative activities could be supported by harambee (fund-raising). Indeed, one harambee was conducted at the time of this fieldwork. 31.3% of the people in the sample were not well informed of the Bamako Initiative activities, hence, they could not comment on its sustainability.

However, the knowledge and perception of the sustenance of the Bamako Initiative attained a significant dependence on gender at the 0.05 level (Table 4.3). Women were more likely to perceive the sustenance of the Bamako Initiative as a government responsibility than the men. The men had a tendency to expect NGO and other donor help for the Bamako Initiative than women. These data indicate that the role of the community in sustaining the Bamako Initiative activities was not well understood. This could be attributed to the incomplete awareness among the local people about the objectives of the initiative. According to most of the respondents, before the launching of the Bamako Initiative programme a census of children was taken without an explanation for the exercise. Key informants indicated that the census was perceived as a preparation for free health services through the B.I/PHC programmes.

**Table 4.3 Who should provide nets and drugs for the Bamako Initiative by gender**

Who should sustain the B.I.	N/a	Govt. & donor	NGO's & donors	Vhc/drug & Net sales	Harambee	Don't know	Total
<b>Gender</b>							
<b>Men</b>	23 (48.9)	18 (39.1)	15 (88.2)	6 (40)	2 (100)	11 (47.8)	75 (50)
<b>Women</b>	24 (51.1)	28 (60.9)	2 (41.9)	9 (60)	-	12 (52.2)	75 (50)
<b>Column Total</b>	47 (31.3)	46 (30.7)	17 (11.3)	15 (10)	2 (1.3)	23 (15.3)	150 (100)

(The figures in parentheses are column percentages)

$X^2$  cal. = 5.390

D.F = 5

CONT.COEFF. 0.299

Critical  $X^2$  = 11.07

0.05 level of significance

Various ways of improving the Bamako Initiative services in Bar Chando sub-location were suggested by the respondents. Under pharmacy improvements, it was recommended that it should be stocked with a variety of malaria drugs as well as medicines for the other common illnesses. The respondents (24%) felt that the pharmacy should be operated as a mini-dispensary by a qualified attendant. They also wished that the community pharmacy should be opened daily to the local people so that the CHW services could be supplemented. 20.7% of the respondents held the view that the CHWs should be trained in health services delivery. The community health workers were generally perceived as incompetent to deal with health care issues. Some of the respondents felt that the CHWs should also be taught how to administer injections which were believed to be a better way of treating diseases. 4.7% of the respondents advocated for further sensitization of the people about the principles and objectives of the Bamako Initiative approach to health care and malaria control in particular, while another 4.7% of the respondents were of the opinion that the drug and bed net prices be

reduced further. A majority of the respondents were not in favour of the arrangement which required that those who could not afford paying for the nets had to deposit money without taking the net. They preferred the conventional hire purchase strategy. Also, some people suggested that in case of an illness, those who could not afford to buy the drugs, such as, chloroquine should be allowed to buy on credit. There was no arrangement of exempting the poorest people from payments or helping them to buy bed nets and drugs more easily. 5.3% of the respondents suggested that there was a need for both the improvement of CHW services and a reduction of the net and drug prices.

Table 4.4 indicates that there was no significant association between the suggestions for the improvement of the Bamako Initiative and gender. However, men were more likely to report dissatisfaction with the CHW system. The community's low awareness about the B.I. malaria control objectives was perceived by more men compared to women. This implies that the perceptions of satisfaction from the Initiative's services were likely to vary with gender. Therefore, apart from the need to involve both men and women equally in the VHC and CHW activities, there should be gender sensitivity regarding the planning and monitoring of the Bamako Initiative so that the local people can express their felt needs and interests through this programme.



**Table 4.4 Gender by suggestions on B.I. programme improvements**

Improvements Suggestions	N/a	Pharmacy improvements	CHWs service improvements	Create awareness	CHW Improvements & price reduction	Don't know	Row Total
Gender							
Men	21 (44.7)	17 (47.2)	18 (58.1)	8 (72.7)	8 (53.3)	3 (30)	75 (50)
Women	26 (55.3)	19 (52.8)	13 (41.9)	3 (27.3)	7 (46.7)	7 (70)	75 (50)
Column total	47 (31.3)	36 (24)	31 (20.7)	11 (7.3)	15 (10)	10 (6.7)	150 (100)

(The figures in parentheses are column percentages)

X<sup>2</sup> cal. = 5.390

DF = 5

CONT. COEFF. 0.186

Significance: 0.370

Critical X<sup>2</sup> 11.070

0.05 level of significance

Most of the respondents (61%) felt that only doctors should serve in malaria treatment and education activities because they had the relevant training to handle malaria control issues. This further implies that the use of voluntary lay workers was most likely to be resented. In fact, in explaining why they preferred only doctors, most respondents said:

*"nikech lakteche go ema osedhi ekos kendo gin ema gi ng'eyo"*

(because doctors have gone for the course and so they are the ones who know)

However, 26.7% of the respondents argued that anyone who has been instructed on how to manage malaria could perform treatment and education duties. 6% of the respondents felt that women should serve in malaria treatment and education activities, since they understood the household health care needs more than men. This response was probably influenced by the fact that most of the CHWs were women. Resort to locally available treatment for malaria was supported by only 25.3% of the respondents. Conversely, 72.7% of them had an inclination for going to hospital immediately for professional treatment.

In fact, there was a significant relationship between gender and responses regarding whether there was a need to go to hospital immediately when malaria attacked (Table 4.5). The data indicate that more women were unlikely to resort to locally available malaria treatment services than men. Although more women than men were likely to perceive the risks and threat of malaria, they apparently preferred going to hospital than using local services which include the B.I. programme. The local services were generally perceived inadequate in terms of diagnosis and reliable treatment.

**Table 4.5 Gender by need to go to hospital immediately when malaria attacks**

Need to go to hospital immediately			
Gender	Yes	No	Row Total
Men	47 (43.1)	28 (68.3)	75 (50)
Women	62 (56.9)	13 (31.7)	75 (50)
Column Total	109 (72.7)	41 (27.3)	150 (100)

(The figures in parentheses are column percentages)

$X^2$  cal. = 6.579

DF = 1 CONT.COEFF. 0.219

$X^2_{0.95}$  = 3.841

0.05 level of significance

Significance: 0.0103

Data on the people's perception of prophylaxis showed that women were more unlikely to take malaria medicine for prevention than men (Table 4.6). This could be an indicator of the fact that women may fear the perceived side-effects of malaria medicines more than men. In this regard, the local people's perception of the efficacy and safety of malaria medicines is likely to vary with gender.

**Table 4.6 Need to use malaria medicines before symptoms by gender**

Gender	Yes	No	Don't know	Total
Men	25 (69.4)	48 (44.9)	2 (28.6)	75 (50)
Women	11 (30.6)	11 (55.1)	5 (71.4)	75 (50)
Total	36 (24)	107 (71.3)	7 (4.7)	150 (100)

$X^2$  cal. = 7.861

DF = 2

CONT. COEFF. 0.223

$X^2_{0.95}$  = 5.991

0.05 level of significance

(The figures in parentheses are column percentages)

There was no significant relationship between gender and the responses showing the rate at which the Bamako Initiative services were used. However, out of the 31 respondents who had acquired chloroquine from the Bamako Initiative, 54.8% of them were women while 45.2% were men. On the other hand, out of the 16 respondents who had bought bed nets from the Bamako Initiative, 37.5% of them were men while the majority (62.5%) were women. The women were more likely to use the Bamako Initiative services because of their easy interaction with CHWs who were entirely women. Alternatively, women are involved in the household health care more than men such that they are more likely to seek the services of health providers.

There was no significant relationship between the perceived domestic needs that would hinder the purchase of bed nets and gender. Similarly, the consideration of buying bed nets when the domestic needs were still unmet was not associated with gender. Furthermore, there was no dependence between gender and the views about payment for the Bamako Initiative services. However, out of the 19 respondents who did not know whether the Bamako Initiative benefited everyone, the majority (63%) were men.

There was a significant dependence between gender and knowledge of non-commercial ways of controlling mosquitoes (Table 4.7). Over half of the respondents

were aware of ethnomedical methods of keeping mosquitoes away. Women knew of herbal repellents more than men. On the other hand, men were more likely to use both ethnomedical and conventional mosquito control methods than women. Conversely, out of the 29 respondents who did not know any non-commercial ways of controlling mosquitoes 18 (62%) were women. These differences could be attributed to laxity in disseminating education messages about mosquito control by the community health workers as advocated for by the B.I. programme. Although more men were more likely than women to report their knowledge of conventional environmental techniques for mosquito control, they did not implement it. Most homes were bushy while many houses were not well ventilated. Key informant interviews revealed that environmental management practices are men's preserve in the Luo culture. In this sense, the B.I. programme was not effective in motivating the men through women CHWs to participate in activities aimed at reducing mosquito breeding and contact with people.

**Table 4.7 Gender by knowledge of non commercial methods of mosquito control**

Non commercial methods	Herbal repellents	Smoke	Burn cow-dung and herbs	Conventional Environmental management methods	Conventional methods, herbs & cow-dung	Do not know	Row Total
Gender							
Men	20 (45.5)	10 (66.7)	5 (29.4)	9 (52.9)	20 (80)	11 (34.4)	75 (50)
Women	24 (54.5)	5 (33.3)	12 (70.6)	8 (47.1)	5 (20)	21 (65.6)	75 (50)
Column total	44 (29.3)	15 (10)	17 (11.3)	17 (11.3)	25 (16.7)	32 (21.3)	150 (100)

(The figures in parentheses are column percentages)

$X^2$  cal. = 17.096

DF = 5

CONT. COEFF. 0.320

Significance: 0.0043

Critical  $X^2$  = 11.070

0.05 level of significance

A majority of the respondents were unlikely to consider the non-commercial methods above as substitutes for bed nets. Over half (54.3%) of the respondents were of the opinion that these techniques were complementary to the use of nets. Furthermore, the null-hypothesis ( $H_0$ ) that preference of non-commercial mosquito control methods over the use of bed nets is independent of gender was accepted at 0.05 level of significance (Table 4.8).

**Table 4.8 Preference of non-commercial methods of mosquito control to bed nets by gender.**

Gender	NA	YES	No	Total
Men	12 (40)	14 (41.2)	49 (57)	75 (50)
Women	18 (60)	20 (58.8)	37 (43)	75 (50)
Column total	30 (20)	34 (22.7)	86 (57.3)	150 (100)

(The figures in parentheses are column percentages)

$X^2$  cal. = 3.933

DF = 2

CONT.COEFF. 0.159

Critical  $X^2$  = 5.991

0.05 level of significance

## HYPOTHESIS 1

**The use of the B.I. malaria control services is related to the perceived costs and benefits of the services.**

This hypothesis was based on the assumption that if the people perceived some advantages of malaria control services, they were more likely to use them. Similarly, it was assumed that the people would not use the services if they perceived the disadvantages of the services. The indicators of the use of malaria control services included:

- i) the responses on the rate of using the Bamako Initiative services;
- ii) whether respondents had ever used bed nets;

- iii) sources of malaria tablets and bed nets;
- iv) perceptions of the use of malaria medicines for prevention;

The indicators of perceived costs and benefits included:

- i) whether the respondents perceived the fact that it took a lot of time and money to treat malaria
- ii) whether respondents perceived that mosquitoes could get reduced on their own;
- iii) the other domestic needs hindering the use of bed nets;
- iv) views on the payment for the Bamako Initiative services;
- v) perceived debts due to malaria illness.

The chi-square values obtained from the cross-tabulations of the above variables did not attain significance at the 0.05 level. It was, therefore, held that the people of Bar Chando sub-location did not make deliberate considerations of the costs and benefits of using the Bamako Initiative services. An attempt to interpret the relationships between some of the variables of use versus perceived costs and benefits is made through selected contingency tables below. Table 4.9 shows that the local people were not committed to the use of the Bamako Initiative services despite their popular perception that it took a lot of time and money to treat malaria as opposed to prevention. There was no significant relationship between the perceived socio-economic costs of malaria treatment and the local utilization of the B.I. services. There was a tendency of the people being apathetic to participating in malaria control activities despite their knowledge of the socio-economic costs of contracting malaria. Generally, rural poverty and lack of awareness about the B.I. would satisfactorily account for the reluctance to participate in the Bamako Initiative activities which required some payments.

**Table 4.9 The use of the Bamako Initiative services by the perception that it takes a lot of time and money to treat malaria.**

Use of the Bamako initiative services	IT TAKES A LOT OF TIME AND MONEY TO TREAT MALARIA		
	Agree	Disagree	Row Total
<b>Always</b>	6 (5.8)	6 (12.8)	12 (8.0)
<b>Sometimes</b>	40 (38.8)	21 (44.7)	61 (40.7)
<b>Most times</b>	16 (15.5)	3 (6.4)	19 (12.7)
<b>Never</b>	41 (39.8)	17 (36.2)	58 (38.7)
<b>Total</b>	103 (68.7)	41 (31.3)	150 (100)

(The figures in parenthesis are percentages).

$X^2$  cal. = 4.459

DF = 3

CONT. COEFF. 0.170

Significance: 0.2160

Critical  $X^2$  = 7.815

0.05 level of significance

Table 4.10 shows that the  $X^2$  value for the variables indicating people's perception that mosquitoes could be reduced on their own and having ever used the nets did not attain a significant association. It was expected that if the people believed that mosquitoes reduced on their own, then they would find the purchase of nets unnecessary. However, even those who had ever used mosquito nets also believed that mosquitoes could get reduced on their own. However, the belief that mosquitoes could get reduced on their own was likely to be a barrier to the people's participation in environmental management for mosquito control.



**Table 4.10 Whether mosquitoes reduce on their own by having ever used mosquito nets**

Mosquitoes reduction on their own				
Ever used nets	Yes	No	Don't know	Row total
Yes	46 (46.5)	24 (48)	---	70 (46.7)
No	53 (53.5)	26 (52)	1 (100)	80 (53.3)
Column Total	99 (66)	50 (33.3)	1 (0.7)	150 (100)

(The figures in parentheses are column percentages)

$\chi^2_{cal.} = 0.91$

DF = 2

CONT. COEFF. 0.1

$\chi^2_{0.95} = 5.991$

0.05 level of significance

As expected, a majority of the respondents perceived the benefits of having bed nets. However, not all those who perceived the benefits had bought the nets. Apart from the perceived protection against the nuisance of mosquitoes, malaria, tsetse flies and cold, other respondents felt that if everyone had nets in the family, harmony would be enhanced. Table 4.11 further indicates that there was a significant association between the perception of payment for the Bamako Initiative services and responses regarding the people's willingness to buy bed nets even when they had other domestic needs. Although the people were willing to buy nets, they actually did not due to lack of money. It can, therefore, be argued that the non-use of the Bamako Initiative services was not related to the conscious consideration of the costs and benefits of the services. Conversely, the local people unconsciously did not prioritize the purchase of nets (and drugs) due to their low income. Most of the respondents who were willing to buy nets even when they had other domestic needs argued that if they had enough money, they would definitely save some for the purchase of bed nets. The residents of Bar Chando could perceive the benefits of using bednets as advocated for by the B.I. programme.

However, this study revealed that the other domestic needs were more likely to be perceived as one of the barriers to taking malaria prevention action, especially the use of bednets. On the other hand, the non-use of the Bamako Initiative services indicated the failure of the programme to make the people understand their role in sustaining it. Based on the above findings, hypothesis 1 was not accepted.

**Table 4.11 Readiness to buy nets even when there are other domestic needs by perception of payment for the Bamako Initiative Services.**

Buy nets even if there are other domestic needs	Pay for Bamako Initiative Services?			
	N/a	Yes	No	Row total
N/a	3 (6.5)	7 (11.1)	4 (9.8)	14 (9.3)
Yes	19 (41.3)	41 (65.1)	10 (24.4)	70 (46.7)
No	24 (52.2)	15 (23.8)	27 (65.9)	66 (44)
Total	46 (30.7)	63 (42)	41 (27.3)	150 (100)

(The figures in parentheses are column percentages)

$X^2$  cal. = 20.816

DF = 4 CONT.COEFF. 0.349

Significance: 0.0003

Critical  $X^2$  = 9.488

0.05 level of significance

## HYPOTHESIS 2

**Participation in the malaria control programme is related to the perceived risks of malaria.**

One of the assumptions of this hypothesis was that the knowledge of the risks of malaria would necessarily prompt the use of the Bamako Initiative malaria control services. The questions on whether malaria kills, the mosquito is a dangerous insect and if there was a need to go to hospital immediately when malaria attacked indicated

the perceived risks of malaria. There were also questions about the delay in malaria treatment and the perceptions of the appropriate time to use mosquito nets. Although a majority of the people (98%) knew that malaria kills, they were not committed to the use of the Bamako Initiative services as shown in the preceding descriptive analysis. Most of the respondents either used the Bamako Initiative services only sometimes while the rest never used them (Table 4.9).

A cross-tabulation of the people's response regarding their need to complete the full course of treatment by their views of prophylaxis yielded some relationship (Table 4.12). The table shows that a majority of the respondents would readily accept the correct use of drugs. However, most of them would not accept prophylaxis. This implies that the local people would rely more on malaria treatment than preventive strategies through drug use.

**Table 4.12 Readiness to continue using drugs after feeling better by need to use medicines before symptoms.**

Medicine after relief	Medicines before malaria symptoms			
	Yes	No	Don't know	Total
N/a	1 (2.8)	11 (10.3)	3 (42.9)	15 (10)
Yes	28 (40.1)	50 (46.7)	1 (14.3)	79 (52.7)
No	7 (19.4)	46 (43)	3 (42.9)	56 (37.3)
<b>Total</b>	<b>36 (24)</b>	<b>107 (71.3)</b>	<b>7 (4.7)</b>	<b>150 (100)</b>

Figures in Parentheses are column percentages.

The data also indicate that although most of the respondents associated high malaria risk with the rain seasons, they were more unlikely to take preventive measures

from the Bamako Initiative services. On the other hand, the findings show that the majority of the respondents (62%) would take malaria drugs immediately they felt the symptoms. However, most of them preferred going to the hospital immediately rather than using the locally available services which would include the Bamako Initiative services. Similarly, very few people had nets or had even used them despite the fact that a majority of the respondents (64.7%) perceived the rain season as the most appropriate period to use the nets.

From the descriptive results above it was held that the use of the Bamako Initiative services was not necessarily related to the people's perception of malaria risk. Therefore, hypothesis 2 was rejected. This implies that the people need more sensitization on the importance of the B.I. and its malaria control services.

### **HYPOTHESIS 3**

**The decisions to use modern malaria control services are mediated by ethnomedical practices.**

The above hypothesis had various assumptions:

- (a) that the local people would use rituals besides modern malaria treatment techniques;
- (b) that indigenous beliefs pertaining to malaria causality and transmission were irrelevant to desired malaria control initiatives;
- (c) that herbal medicines were alternatives to modern treatment of malaria;
- (d) that herbal repellents were likely to be an alternative to modern mosquito control measures;
- (e) that prayer was an alternative to modern treatment of malaria;
- (f) that the use of ethnomedical remedies would influence the way modern medicines were used to treat malaria.

There was a relationship between the belief that prayers cure malaria and the use of B.I. malaria control and other services. Key informant data also revealed that more people, especially from the Israel, Power and Pentecostal churches, believed that prayers cure any kind of illness. Through the group discussion it was noted that some CHWs served their clients with a bias due to their religious affiliations. For instance, it was claimed that members of certain denominations such as Luong Mogik were discriminated against due to their religious doctrines regarding healing. Although 23.3% of the respondents agreed that prayers heal malaria, only 5.7% in this study reported having actually used prayer to cure and heal their last bouts of malaria.

The study revealed that self-diagnosis and treatment were important aspects in malaria management by the residents of Bar Chando. Table 4.13 shows the instances at which the local people would perceive that the malaria threat was serious and, hence, decide to use anti-malaria drugs such as chloroquine and malariaquin.

**Table 4.13 Instances when anti-malaria drugs are used.**

When malaria drugs are used	Frequency	Percentage
When symptoms are felt	93	62
When disease is severe	40	26.7
Regular for prevention	3	2
After professional medical advice	4	2.7
When frequent recurrence is perceived	5	3.3
Do not use drugs	5	3.3
Total	150	100

The above data indicate that the residents of Bar Chando were likely to freely move between the ethnomedical and biomedical sectors of health for self-treatment of

malaria. Although a majority (92%) of the respondents said that they would not consult a traditional mediceman (ajuoqa) for diagnosis and treatment of malaria, 65.3% said that they would consult him when they perceived that modern doctors failed to treat particular malaria cases. Other respondents claimed that the traditional healer would be consulted when the cause of the malaria-associated illness was unknown.

The use of the Bamako Initiative services by the use of traditional medicines showed some association (Table 4.14). These findings imply that the primary health care services under the Bamako Initiative approach in Bar Chando sub-location are more likely to compete with ethnomedical practices. There was a variety of herbal medicines for malaria treatment (Appendix D).

**Table 4.14 The use of the Bamako Initiative services by the use of traditional medicine.**

Use of Bamako initiative services	USE OF TRADITIONAL MEDICINE					
	Once	Sometimes	Always	Most times	Never	Total
Always	1 (5.9)	7 (95.)	1 (12.5)	1 (4.2)	2 (7.4)	12 (8)
Sometimes	9 (52.9)	36 (48.6)	1 (12.5)	5 (20.8)	10 (37)	61 (40.7)
Most times	2 (11.8)	9 (12.2)	4 (50)	2 (8.3)	2 (7.4)	19 (12.7)
Never	5 (29.4)	22 (29.7)	2 (25)	16 (66.7)	13 (48.1)	58 (38.7)
<b>Total</b>	17 (11.3)	74 (49.3)	8 (5.3)	24 (16)	27 (18)	150 (100)

The local people preferred buying medicines from local shops because they could buy a variety and mix them just like they would do in the use traditional medicines. Furthermore, the local people believed that using assorted medicines were more

effective than a single type. The group discussion and key informants further revealed that herbal repellents and the use of cow-dung smoke to keep away mosquitoes were still used in the sub-location (Appendix E). These methods formed part of the people's alternatives to the use of bed nets and other commercial ways of keeping mosquitoes away from human beings (see also table 4.1). Therefore, the data confirmed that there were still ethnomedical practices used in malaria control which would compete with new programmes such as the B.I. On the other hand, the local people's understanding of malaria transmission and causality was likely to impede their correct use of control measures as shown in the descriptive results. Therefore, hypothesis three above was accepted.

#### **HYPOTHESIS 4**

##### **Accessibility to the other health facilities and services influences the use of the B.I. malaria control services**

This hypothesis was based on the assumption that the perceptions of access to the Bamako Initiative services vis-à-vis other sources of health care determined the utilization of the Bamako Initiative. Questions on the source of the treatment of the last malaria illness, the general source of medicines, the source of chloroquine and bed nets were used to highlight the people's accessibility to the Bamako Initiative services. The data revealed that a majority of the local people relied on the health centres or the hospital and local shops for medicines more than the Bamako Initiative implying that these other sources were more accessible (table 4.14). Out of the 31 respondents who acquired chloroquine from the Bamako Initiative, only 11 had sought treatment from it during their last malaria illness. Alternatives to the Bamako Initiative programme



included local medical practitioners, the hospital, local drug sellers, shops and home prayers. Only 8.7% of the respondents had sought treatment for the last malaria illness from the Bamako Initiative programme. 56 (37.3%) of the respondents preferred the various sources of medicine because the sources were perceived to be within a walking distance while only 10% of the respondents perceived the CHWs and the B.I centre to be within a walking distance (see also Table 16). From field observations, it was noted that lack of appropriate services within the Bamako Initiative programme also influenced the people's perceptions of their access to better services. At the time of the fieldwork no CHW had chloroquine in their kits. Many respondents and the key informants indicated that the local people felt that they were inaccessible to a variety of drugs if they relied on the Bamako Initiative only. The perception of access to appropriate services was also influenced by the people's view that the CHWs were incompetent. The people generally felt deprived of services such as the injections, diagnosis and other malaria medicines which were not provided under the Bamako Initiative.

**Table 4.15: The Respondents' Sources of Chloroquine**

SOURCES OF CHLOROQUINE	FREQUENCY	PERCENTAGE
Never used	3	2
CHW/Bamako Initiative	31	20.7
Hospital/Health centre	30	20
Shop	71	47
Private dealer	3	2
Chemist	7	4.7
Local biomedical practitioner	5	3.3
Total	150	100

**Table 4.16 Reasons for Preference of sources of chloroquine and other anti malaria drugs**

REASONS FOR PREFERENCE OF SOURCE	FREQUENCY	PERCENTAGE
Don't buy drugs	1	0.7
Perceived effectiveness of the medicines	50	33.3
Walking distance	56	37.3
Cheap medicine	15	10.0
Family and friends suggest source	1	0.7
Drugs always available	27	18
Total	150	100

Table 4.15 shows that perceived efficacy of remedies and physical distance were the main variables which defined accessibility for the local people. The issue of physical distance also arose in relation to the location of the community pharmacy (see Map 4). The pharmacy was not centrally located, a fact which most respondents and key informants were aware of. During the rains, access paths and roads leading to the pharmacy from various clan villages were too muddy to be used. The inaccessibility of the pharmacy was also explained in terms of the social difference between the family which donated the pharmacy building and the rest of the villagers. In some cases, the residents of Bar Chando sub-location expressed the feeling that the location of the community pharmacy was not appropriate. They argued that since the B.I. programme bears the name of their sub-location then, the centre should have been put up within the administrative boundaries of Bar Chando. The study also revealed that there was inadequate access to information about the Bamako Initiative approach to malaria control. 62% of the respondents had never heard about malaria control while 53.5% of them had never met CHWs delivering health care information. Of those who had ever met a CHW, only 14.7% had been told something about malaria control (Table 4.2). Consequently, it was noted from observations that the local people did not adequately

participate in environmental measures of mosquito control such as bush clearing and ventilating houses. On the basis of the above data, hypothesis four was accepted.

In this study, there were no major gender differences regarding the local perceptions, knowledge of malaria and utilisation of the B.I. services. The main differences which were found were related to community participation in programme activities and their implementation. Women took up the CHW roles while men were VHC members. These roles were divided between men and women based on already established traditional gender roles in maternal and child health care and decision making respectively. However, the CHW and VHC participation had very little impact in mobilizing the popular use of the B.I. services. Generally the low utilisation of the B.I. malaria control services can be attributed to low awareness about the programme, inappropriateness of the bednets and education strategies and low incomes. The other barriers to the B.I. programme utilisation include, inadequate knowledge about malaria, its causality and transmission among the local people, inaccessibility to the B.I. centre, perceived incredibility of the CHWs and the use of traditional resources in the treatment of malaria-associated illnesses and keeping mosquitoes away.

Among the locally existing malaria control alternatives in Bar Chando, the B.I. programme is the least utilized. The programme is not well adjusted to adequately meet the local malaria control needs within the socio-cultural context. Community participation in terms of equal access to the benefits of the B.I. has not been realized. The relevance of the programme to malaria is affected by variations between and within households with respect to economic resources, social contacts, access to new information, levels of education and other ecological factors. The implications of our findings for the B.I. approach to malaria control in Bar Chando are discussed in the next chapter

## CHAPTER FIVE

### DISCUSSION OF THE FINDINGS AND CONCLUSIONS

#### 5.0 INTRODUCTION

This chapter provides a brief discussion of the research findings presented in chapter four. The implications of these data for the successful implementation of the Bamako Initiative community-based malaria control programme are also highlighted. The discussion is followed by conclusions and recommendations.

#### 5.1 DISCUSSION

The study revealed very few differences between men and women regarding their knowledge, perceptions of malaria and use of the B.I. malaria control services in Bar Chando. However, there is a variation in the information sources concerning this initiative and its malaria control activities. Thus, men are more likely to be exposed to malaria control information because the PHC/Bamako initiative information is given at the Assistant chief's barazas which are attended by very few women. Among the Luo, there is a rigid division of labour based on gender. Attending barazas is not one of the responsibilities of women since it is partly a public relations activity reserved for men. Therefore, using the public barazas is not an effective strategy for disseminating the B.I. education messages since women who are part of the target group can not be reached through such venues. Similarly, women were more likely to get preoccupied with other health care messages that they failed to report to the investigator having been informed about malaria. It seems that women were more keen with other issues discussed by CHWs such as, sanitation and hygiene, child care and the need to buy medicines for emergency use in the households. On the other hand, malaria control information may have been unconsciously omitted by the health providers. Very few of the residents in

Bar Chando sub-location mentioned the CHWs as the source of the information about malaria control. This implies that the role of the CHWs in educating the people about malaria was not fully realized. However, the B.I. may not be unique in its skewed information outreach. What is more important is that the B.I. should make its messages more relevant to the local situation. There should be more use of appropriate cultural analogies and metaphors drawn from the local knowledge about malaria and concepts of community health initiatives.

The data also indicated that the people had not clearly understood their own role in financing the drug and bed net activities perhaps because the principles of the Bamako Initiative were not properly explained to them. Most of those respondents who seemed to understand the role of the community in financing the B.I. through a revolving fund were women. Since there was only one male community health worker in the B.I. programme, it is most likely that the mobilizing of the men to participate in the Bamako Initiative activities would not be fully realized. This implies that the education of the local people about the B.I. and its community-based health care activities would be more successful if more male CHWs were recruited.

The data imply that satisfaction with the initiative's services may be viewed differently by the local people depending on gender. In order to increase the people's commitment to sustaining the malaria control activities and other B.I. services, there is a need to address the perceptions of the Bamako Initiative's inadequacies which tend to vary with gender. For instance, more women showed the preference for going directly to the health centre to seek help than from community health workers when attacked by malaria. The local people's perceptions of the competence of the CHWs would

adversely affect their willingness to use community-based health services. The data also imply that over half of the women interviewed had a negative attitude about using malaria medicines for prevention. A majority of those who did not support preventive measures through taking medicines before seeing signs of the disease argued that such a practice would make malaria resistant to treatment. On the other hand, the research revealed that prophylaxis was not emphasized in the study area by the B.I. Furthermore, the B.I. programme in the area distributed only chloroquine, a drug that is no longer recommended for malaria prevention. The lack of prophylaxis in the B.I. malaria control programme and the people's negative perception of it would retard malaria control efforts. This is because chemoprophylaxis for vulnerable groups during the rainy seasons, may be an advantage in malaria control (MacCormack et al. 1989) because prophylaxis reduces morbidity and mortality better than treatment (MacCormack 1984).

There was no significant association between the use of malaria control services and perceived socio-economic costs and benefits. However, a few factors emerged as the costs (discouraging factors) and benefits (encouraging factors) of the use of the B.I. malaria control services. To the majority of the respondents, lack of money constrained the use of bednets. Consequently, they felt that they would not buy bednets when other domestic needs were unmet. This finding implies that most residents of Bar Chando could not raise the money required to purchase bednets. They would not afford a relatively large sum of money for the nets, even if they were to consider only a few members in their families which are mostly polygynous. In this sense, the cost of the nets is a barrier to the local participation in the B.I. programme.

Some respondents seemed to differentiate between the use of bednets for

protection against malaria and that against mosquitoes. This can be attributed to the incomplete understanding of malaria causality and transmission. Some respondents also stated that if they were able to buy bednets for the whole family, harmony within their households would be enhanced. This implies that the study population considered buying bednets for only a few members of the households to be a potential source of intra-family jealousy. However, most respondents showed a willingness to pay for the bednets (Table 4.11) unlike people in a Fula village, Gambia (MacCormack *et al.* 1989) who were not willing to pay the local market price for bednets. Most of the respondents in Bar Chando argued that in real life there is some form of payment for any kind of service rendered. They recognized the fact that the CHWs needed incentives from such payments and that some costs of bringing drugs and nets would be met through user fee. This finding is consistent with Geest's (1992) argument that the payment for essential medicines and health services under the Bamako initiative would be culturally compatible in African communities. He argues that paying for goods and services need not conflict with existing traditions of reciprocity in the field of health care. Although the residents of Bar Chando sub-location generally understood the need to pay for basic health services, they seemed confused over the role of the government, NGOs and other donors in providing health care. Furthermore, the exemption of the poorest from payment as stipulated by the B.I. would not be a viable strategy since the majority of the people in the study area were poor. There is still a need to devise acceptable ways through which the financing of the bednet and chloroquine supplies can be realized. While the arrangement of the payment for nets by instalments was not acceptable, the distribution of chloroquine and other anti-malaria drugs on credit was desired by many



respondents. On the other hand, a section of the respondents felt that the Bamako Initiative services did not benefit everyone in the study area. The low affordability, lack of awareness about the services, inaccessibility and low confidence in the CHW services were given as some of the reasons for the perceived unequal benefits derived from the Bamako Initiative programme.

Owing to their meagre incomes, some of the respondents in Bar Chando sub-location wished that the already reduced B.I. bednet prices were lowered further. Alternatively, they longed for an affordable hire purchase arrangement that would enable them to own the impregnated mosquito nets. On the other hand, this research has revealed that the lack of beds and mattresses would negate the desire to purchase bednets. This is because most households had one or two beds used by parents while children slept on floor mats. Therefore, the bednets were not appropriate for malaria prevention to the residents of Bar Chando and especially children who are the target group of the B.I. Whichever way, there is a need for the Bamako Initiative programme to encourage people to use locally available materials to make beds. This will make it easier later on to convince them that mosquito nets are necessary so that the nets can be given a higher priority against other domestic needs.

Itching has been widely reported as a factor hindering the use of chloroquine in various studies (Mnyika *et al* 1995; Steketee *et al* 1994; Abdullah 1984). However, it should be noted that some rural people, as observed in Bar Chando, maybe unable to associate particular problems with the use of malaria drugs. Most of the respondents argued that for them to use chloroquine, they needed to be sure that they had enough money to buy Piritons to allay itching. The respondents claimed that itching would last

upto one week, implying that they would need more Piritons. These respondents gave various other general problems which they associated with the use of chloroquine and other malaria drugs. The problems included itching and dullness (12%), body pains and weakness (6%) and dullness (4%). 4.7% of the respondents claimed that malaria drugs were nauseating and would even make them vomit. 12% of the respondents stated that the use of malaria drugs resulted in a combination of itching, bodily discomfort and rise in body temperature. Some of the respondents claimed that the use of chloroquine resulted in delirium and nightmares, although 25.3% of the people in the sample did not remember any problem encountered in the use of malaria medicines. Only one respondent claimed that there was no problem when he used chloroquine and other anti-malaria drugs. Furthermore, 68% of the respondents perceived some problems encountered by pregnant mothers which they attributed to the use of anti-malaria medicines, particularly chloroquine. The respondents believed that the use of chloroquine (and other anti-malaria drugs) would lead to the following problems: miscarriage and death of expectant mothers (38%); miscarriage and still birth (17.3%); fatigue (6%); and stomach problems (2%). The perceptions of the above side-effects would lead to a low utilization of chloroquine, which is the cheapest anti-malaria drug distributed under the Bamako Initiative.

Nearly all the respondents stated that malaria kills and that the mosquito was a dangerous insect. Since the low utilization of the Bamako Initiative services was not associated with perceived risk, other factors were noted as barriers to the use. The factors included lack of trust in the drugs supplied by the Bamako Initiative programme, perceived incompetence of the CHWs as well as a poor understanding of malaria

causality and transmission. All the respondents in Bar Chando were aware that malaria reached its peak during the rain seasons. As a result, a majority of the respondents perceived the rain season as the most appropriate period to use the bed nets. This perception is likely to lead to fluctuations in the use of nets (c.f. Winch et al. 1994). This implies that the local people may postpone buying the nets if they had the money during the dry season. Similarly, those who have the nets may not use them consistently due to their perception of risk from the mosquitoes. The whole of Siaya District (Map 2) lies in a region of stable malaria (UNICEF 1991b). It is a holoendemic malaria region, where very high amounts of malaria cases are reported throughout the year (Map 1). Therefore, there is a need to educate the people of Bar Chando sub-location in particular and Bondo division in general about the importance of using the bed-nets consistently throughout the year.

The local people had a negative attitude to chloroquine prophylaxis, in particular, because of a dislike for its bitter and unpleasant taste, lack of money and the absence of the concept of prevention in the traditional use of medicines. Although some people in the study area were complacent about malaria, the perceived threat of the disease did not appear as a reason for the non-use of the Bamako Initiative services as postulated in the health belief model. Over half of the people in the Bar Chando sub-location sample showed that they would be willing to complete the full course of medication. Such willingness has an important role to play in malaria control efforts especially in enhancing educational messages about malaria management. The fear of the unpleasant taste of drugs, the perception of no need to continue using drugs after feeling better and the need to keep medicines for the next illness were the reasons given by those who would

not complete the course of treatment. These findings imply that the Bamako Initiative programme in Bar Chando sub-location still needs to educate the people on the correct use of anti-malaria medicines because it would be useless to treat malaria while the human parasite reservoir is still maintained by those who do not follow the prescribed course of treatment. This study indicates that there is an association between the use of the Bamako Initiative services and traditional medicines. This implies that there is some competition between ethnomedicine and modern medicine for clients. There was an indication of a negligible use of rituals for malaria treatment. Most of the respondents who believed in faith healing would take malaria medicines immediately they felt the symptoms, but some would take the medicines when they felt that the disease was recurring. Responses from key informants showed that more people had a tendency toward faith healing, a practice that would cause delay in the objective management of malaria. It is most likely that those who denied that prayers healed malaria thought the researcher was interested in such a response.

Most of the ethnomedical practices described involved the use of leaves, barks and roots which are boiled and the solution taken orally. This finding contrasts with the report about the Luo of Karateng, Kisumu district, that there were no traditional medicines for malaria treatment (Abdullah 1984). Most respondents in Bar Chando sub-location stated that the traditional treatment of malaria involved the use of "bitter medicines" (locally called Yien Makech). In fact, bitterness was one of the known similarity between modern malaria medicines and traditional medicines. It is believed that such bitter medicines cure malaria through induced vomiting and cold rashes on the mouth. A knowledge of the expected qualities of malaria medicines from the

ethnomedical perspective may be useful in promoting the use of the medicines distributed under the Bamako Initiative. For example, the bitterness of a herb called Akech (*Veronia* sp) was equated to that of chloroquine and malarquine. Most of the traditional malaria medicines were also believed to cure other illnesses and especially stomachaches. Interestingly, stomach-related problems which have been associated with malaria in the area may be attributed to the use of unclean water, eating poorly prepared food, typhoid, amoebic dysentery and spleen disorders caused by chronic malaria (locally called hima).

The problem of clean water supply remains a major challenge to primary health care and the Bamako Initiative programme in the whole of Bondo division. Thus, the febrile illnesses associated with the use of dirty water are probably confused with malaria as the other uses of most traditional malaria medicines indicate. A poor understanding of malaria and the multiple illnesses targeted by single traditional medicines could partly explain the use of non-recommended medicines such as Aspro, Panadol, Vicks, Aspirin and Indocid for malaria treatment by some local people. However, Kawango (1995:81) observes that the multiple use of medicines among the Luo offers a kind of comprehensive health insurance so that all possible causes are covered simultaneously. On the other hand, the appropriate use of modern and traditional malaria medicines would require more awareness on the cause, transmission and symptoms of malaria. Since symptoms of different diseases overlap (Kawango 1995) the local people may not be sure that what they are treating is malaria.

A number of respondents were unwilling to talk about traditional medicines. This could be partly because some of them viewed the investigator as a government

representative whose reports would influence health care assistance. The respondents perceived the government as being against traditional medical care. Key informants confirmed that the respondents could not freely give information on traditional medicine due to the fear of legal and social reproach. This implies that the local people are likely to use traditional medicines secretly because ethnomedicine lacks official recognition. In this sense malaria patients are also likely to consult poorly trained practitioners or use the wrong herbal concoctions and dosages. Therefore, there is a need for an official recognition of traditional anti-malaria medicines and practices so that their use are regulated.

The use of traditional resources to treat and prevent malaria besides the alternatives provided by the Bamako Initiative programme (that is, chloroquine and mosquito nets) should be viewed as the local people's cultural adaptation to their environment (cf. MacCormack 1984). Indeed, this study has clearly indicated that a majority of the respondents used both traditional and modern medicines to treat their last bouts of malaria. This also implies that if the community health workers had a thorough knowledge of the existing traditional cures for malaria, they would promote the alternatives provided by the Bamako Initiative more easily. The local malaria control strategies can also complement the B.I. objective of assisting the poor people maintain their health. In the same vein, Nyamwaya (1995) points out that the co-existence of biomedical and ethnomedical practices calls for a thorough understanding of traditional therapies and practitioners to enhance consumer satisfaction. In this study, it was found out that the belief that local beer (*chang'aa* and *busaa*) protects one from malaria infection would be a hindrance to malaria control efforts. With such a belief, the efforts

to reduce the parasite reservoir in human beings through prophylaxis and chemotherapy would be very difficult.

Apart from an established anti-parasite herbal tradition this study has also revealed that there exists several local anti-vector strategies. The use of smoke from cow-dung and other sources, sprinkling houses with herbal water and the general use of herbal repellents are used to drive mosquitoes away. Most of the local mosquito repellents in Bar Chando sub-location were simply referred to as "mosquito medicine" (yath suna). This finding implies that an intervention programme such as the Bamako Initiative needs to base its activities on the knowledge of the local adaptation to the mosquito nuisance. The study also indicates that there is a great potential in the use of herbal plants of the ocimum category to reduce the human-mosquito contact. For example, in this study, a plant called bwar (*Ocimum basilicum*) was widely mentioned as a mosquito repellent.

The findings on ethnomedical practices in this study indicate that the study area has a potential for providing local resources for malaria control. This would strengthen the efforts in Third World countries to develop well known and tested herbal medicines for use in primary health care centres. The assessment of the ethnomedical practices would strengthen the efforts towards malaria control under the Bamako Initiative approach. Since medicines derived from local resources would be cheap, affordability and acceptability of the primary health care services will be realized. Studies on the efficacy of the herbal resources used in malaria control within Bar Chando sub-location would be beneficial not only to this area, but also to the entire Siaya district. Such studies have been fruitful in Sri Lanka where a local herb called dummella



(*Trichosanthes cucumerina*) was found to be an effective medicine against fevers (Silva and Tudor 1991). The Bamako Initiative approach to malaria control can also be enhanced through efforts to integrate traditional strategies in the mainstream of modern measures. This is primarily because interventions based on established values and practices can be more readily accepted than unfamiliar ones. According to Aubel and Samba-Ndure (1996), the acceptance of locally compatible interventions tend to be more sustainable. Similarly, the ever increasing cost of imported drugs implies that the incorporation of traditional pharmacopeia into medicine would facilitate the objective of Health for all by the year 2000 (Bennet 1989; Bannerman et al. 1983).

This study has similarly revealed that the local people had more access to shops, health centres and other sources of malaria control services than to the Bamako Initiative services. Most of the respondents preferred buying medicines from the shops because of the perceived efficacy of drugs sold there. Others stated that shops were within a walking distance. Similarly, most of the people felt that the Bamako Initiative programme did not distribute a variety of drugs as those found in the shops. These observations seem to tally with Kyallo's (1993) opinion that a lack of appropriate drugs is a major problem for the Bamako Initiative programme. The people's preference for treating malaria in the health centre (or hospital) also indicated their low confidence in the locally available alternatives which include the Bamako Initiative programme. On the other hand, it was observed that very few CHWs had drugs remaining in their kits during the fieldwork. Similarly, very few respondents seemed to realize the fact that the drugs offered by the Bamako Initiative were cheaper.

The failure to buy mosquito nets could also be attributed to the people's ignorance

about malaria transmission and the need to use the nets for protection. The group discussion revealed several other perceived problems of using bed-nets. It was observed that the local people complained that the nets were not high enough so that they could drop from the roofing poles of grass-thatched houses. On the other hand, it was noted that the local people considered mosquitoes more of a nuisance when they entered through torn parts of the nets and the open spaces. There was also the fear that the insecticide-impregnated nets would poison the users and especially children. Some people feared that bed-nets would easily catch fire from the cooking hearths or lanterns and, thus, cause damage to the houses and other property as well as death to people. Observations and key informant interviews also revealed that lack of beds discourage people from buying the nets. A majority of the respondents also did not have a source of regular income. Income is an important enabling resource that would influence the equitable access to health services (Andersen 1995). Infact, some of the respondents who participated in this study felt that the Bamako Initiative services did not benefit everybody. They argued that either some people did not totally afford the prices of bednets and medicines or some were unaware of the Bamako Initiative services. In a study conducted by Lasker (1991) in Cote D' Ivoire, the cost of health services was also identified as a variable of accessibility. Such enabling resources may provide a means for use and increase the likelihood that the use of health services will take place (Andersen 1995; Cockerham 1992).

Most of the respondents in this study had never met the CHWs performing their primary health care duties. For example, a majority of the CHWs could not be found in their homes when the people wanted to consult them while some of them had dropped

out due to lack of motivation. On the other hand, the low utilization of the CHWs could be explained by reasons such as: the people's lack of confidence in the ability of the CHWs to treat malaria and other illnesses, the CHW's lack of enough drugs and the clients' perception that they supplied expired and non-efficacious drugs. These health workers had also received training for only two weeks yet they were expected to handle serious health issues which included the proper treatment of malaria. This implies that without proper CHW training, community-based malaria control approach, such as the Bamako Initiative, may not guarantee better access to reliable or professional services.

The Bar Chando sub-location villagers doubted the competence of the CHWs whose knowledge they felt was the same as the empirical knowledge of laymen. Some people in Bar Chando still associate the CHWs with the traditional role of TBAs. This means that a CHW must demonstrate his or her skills in diagnosing and treating sick people and his/her success determines the degree of trust and confidence the community will have in him/her (Cripwell 1981:86). A lack of confidence in health providers impedes the social-psychological accessibility to health care. This type of accessibility relates to the quality of communication between providers and consumers and the user's satisfaction with the encounter (Lasker 1981).

It was also found that inter-clan differences affected the CHW performance. Key informants and the group discussions revealed that members of different clans were not easily served by CHWs from the other clans. On the other hand, members of the family which donated the community pharmacy building were perceived as non-sociable. However, this attitude was based on social class differences and the villagers' prejudice against the family in whose compound the community pharmacy was located. It was

observed that some local people thought that the hosts of the B.I. pharmacy were enriching themselves further from the B.I. funds. Such attitudes of unfriendliness would also impede the access to malaria control services provided at the community pharmacy.

Further more some people felt that the B.I. would be more acceptable if the centre was located within their own sub-location.

The CHWs were not supervised. Supervisory work was expected to be done by only one divisional coordinator of the Bamako Initiative. The absence of supervision further implies that the CHWs would not carry out malaria control activities adequately, which further justifies the villagers' low confidence in the CHWs. Key informants indicated that most of the CHWs did not follow any set guidelines of prescriptions. In fact, they sold medicines according to the clients' ability to pay. Such a practice would retard malaria control efforts since the parasite reservoir in human beings would never reduce due to the incorrect use of the drugs. The above finding tally's with the view that the supervision of community health workers has been one of the drawbacks of the Bamako Initiative (Kyallo 1993). Regular supervision is important because it would improve the prescribing practices that are crucial in malaria control. The performance of CHWs in Bar Chando is also negatively affected by lack of motivation through monetary rewards and other incentives. This implies that the expectation that the CHWs would work as volunteers has proven unrealistic in this B.I community.

This study also revealed that there was no referral system supporting the Bamako Initiative approach to malaria control in Bar Chando sub-location. Very few of the respondents stated that they went to hospital or health centre after the CHWs' advise. However, this was not a serious referral, since it was presented as a particular CHW's

subjective recommendation about the need for clients to go to hospital. Most of the respondents would go to hospital only when they felt that the locally available remedies were not treating them. Other motivations for visiting the health centres were the perceived severity of the disease and the clients inability to find CHWs in their homes. Generally, the community health workers were perceived as being unable to advise their clients on what to do or where to go if malaria persisted. The people's preference for going to the hospital immediately when malaria attacked was based on their own beliefs that it was only in the hospital that they could get prompt and valid treatment given by qualified personnel. Similarly, the local people held the view that hospitals and health centres provided trustworthy prescriptions and drugs. The credibility of the CHWs was doubted due to their low educational backgrounds, little training and their general inadequacy in health care activities. These findings indicate that the implementers of the Bamako Initiative approach to malaria control need to convince the target population that the volunteer health workers are credible enough. The perceived credibility of community health workers is an important factor in the local people's participation in primary health care initiatives (Belcher et al 1975; Stone 1992; Delacollete et al. 1996). Within the Bamako Initiative in Bar Chando sub-location, the people need to be convinced that the CHWs are able to dispense medicines and offer cures for malaria and other illnesses.

There are four main anti-malaria components in the Bamako Initiative package. The B.I. aims at improved diagnosis and treatment of the disease. The initiative also emphasizes on individual protection through the use of insecticide-impregnated bednets. Thirdly, there is an advocacy for environmental management to control mosquito

breeding and human-mosquito contact. To enhance adequate management and prevention of malaria illness, the B.I. depends on the health education component. The data in this study indicate that the successful implementation of all the B.I. malaria control goals in Bar Chando sub-location are still constrained by the sociopsychological and structural variables highlighted in the health belief model. There are also social, cultural and economic barriers to the likelihood of local participation in the B.I., which need to be addressed. This study illustrates that the official B.I malaria control policies may have little impact at the rural village level, due to unforeseen micro and macro-ecological factors.

The B.I. was introduced in Bar Chando sub-location by UNICEF in collaboration with the Ministry of Health and an NGO known as Community Initiative Support Services (C.I.S.S.). The programme was presented to the local people as an external intervention. The B.I. therefore, was super-imposed on an inadequately established PHC project in the community. The already existing PHC project was neither well defined nor grounded to provide a stable foundation for the Bamako Initiative.

The B.I. was introduced to the community residents through a group of local elites. An awareness campaign was done for a very short duration of two weeks in the weekly public meetings and churches. In these venues, a significant proportion of the potential beneficiaries of the B.I were not reached. As a consequence, the local people were not adequately involved in the programme planning. This implies that, the residents of Bar Chando were not given a sufficient opportunity to incorporate their felt needs and concerns in the B.I. so as to make it a true community-based malaria control programme in their own environment.

## 5.2 CONCLUSIONS

In the general sense the Bamako initiative is relevant to malaria control in the Kenyan national context. The objectives and principles of the initiative are consistent with the national policy of self-reliance and the District Focus for Rural Development.

The Bamako Initiative approach is justified in social terms since it aims at strengthening the accepted health care goals. The B.I. is also in line with the national plan for malaria control. This plan recognizes the need for integrating malaria control activities into other activities at the community level using the experiences gained for basic community health care through the B.I. approach (WHO 1995). From the preceding literature review, the B.I. is justified by the fact that there is no other programme at least at the moment, that would provide an alternative to deal with the malaria control problem at the rural grassroots level. However, this study shows that the B.I. has not been an effective and relevant approach in the context of Bar Chando sub-location in particular and the rural areas of Bondo division in general.

There are no major gender differences regarding the knowledge, perception and the use of the B.I. Malaria control services. Nonetheless, very few people are actively participating in the B.I. malaria control activities and using its services. The main gender differences are at the level of community participation in assuming roles of Community Health Workers (CHWs) and managerial responsibilities. Basing on the Luo cultural division of labour, the village health committee (VHC) is entirely constituted of men, who are traditionally recognized as the managers and decision-makers. The members of the VHC are drawn from the institution of village elders and given the responsibility of deciding how the B.I. activities are to be conducted. On the other hand, the CHWs are



entirely women, who are given their responsibilities on the basis of the traditional roles of traditional birth attendants in health care. This difference indicate that men and women in the study area do not share equally in the health care burden.

According to this study, the VHC is not effective since none of its meetings was successful. Further more, the local people are not involved in planning and translating their felt needs into grassroot initiatives. Thus, a negligible proportion of the community members are participating in the B.I. benefits by, for instance, receiving health services or education. The gender differences at the level of implementation could account for the general tendency of more women than men turning up for the programme. However, the women have little understanding of malaria and the B.I. services related to its control. This can be attributed to the women's low literacy levels and the little time given to health education by CHWs.

The CHW system in the study area is ineffective. The CHWs are viewed by most the local people and especially men as incapable of dealing with biomedical issues associated with new interventions such as the B.I. In particular, the B.I. approach to malaria control is associated with modern technology and, thus, the CHWs are inappropriate in treating and educating the local people about malaria. Furthermore, the use of the term Nyamrerwa for the CHWs serving in malaria treatment and prevention activities contributes to the people's perception that the lay health workers' role is ambiguous. Since the CHWs are still perceived in their traditional roles, they are viewed as lacking the relevant professional status to participate in the new malaria intervention programme.

The use of the B.I. malaria control services is not significantly associated with the

local people's perception of the risk of the disease. Similarly, the perception of costs and benefits do not serve as the immediate motivations for the use of the B.I. services and participation in its malaria control activities. The low incomes and the poverty levels prevailing in Bar Chando sub-location are the main barriers to the likelihood of the local participation in malaria prevention activities especially the use of bednets. Another important barrier to the use of the B.I. services is accessibility. The location of the B.I. centre for Bar Chando sub-location is in a different administrative area (see Map 4). This magnifies further the local people's perception of inaccessibility to the services. In this sense, some people are likely not to identify with the programme as their own. In general, the local people are more accessible to the other sources of malaria treatment and prevention, particularly, the local shops than the B.I. Alternatively, the appropriateness of the B.I. malaria control activities and services is undermined by inadequate cues to action in terms of low awareness about the programme.

The use of ethnomedical resources in malaria treatment and prevention in the study area represent an effective adaptation to the local ecosystem. Similarly, the local people are gradually incorporating the biomedical resources into the local traditions of conceptualization and treatment of malaria-associated illnesses. However, the easy access to traditional resources of malaria control is likely to compete with the B.I. programme services for clients. A large proportion of the respondents use both herbal and biomedical malaria therapies on the basis of their ethnomedical understanding of the disease. Thus, the community members are likely to use wrong dosages or medicines due to their inability to correctly interpret disease symptoms. In this sense, the B.I. has not adequately addressed the local needs in terms of knowledge about malaria causality,

transmission and the relevant control strategies. Thus, the local people lack the relevant knowledge to instigate true participation in malaria control.

From the preceding findings, discussion and conclusions, the recommendations below will be helpful in modifying the Bamako Initiative to be relevant to malaria control in Bar Chando sub-location and other rural areas of Bondo division in general.

### 5.3 RECOMMENDATIONS

In the rural areas, such as Bar Chando sub-location, the people live on very meagre incomes which hardly satisfy their basic needs. Basically, the community require economic empowerment. Therefore, it is suggested that feasible community-based income generating activities be introduced by the VHC along the other Bamako Initiative activities. This will facilitate the setting up of a revolving fund for the Bamako Initiative facilities and, thus, sustain the programme.

It may be beneficial to encourage the village health committee to endorse the <sup>sale</sup> ~~sell~~ of bednets on a hire purchase basis. Similarly, the local people should be made to understand the rationale behind the <sup>sale</sup> ~~sell~~ of bednets and medicines. The role of donors such as the UNICEF should also be made clear so that the people may not continue viewing the Bamako Initiative as a programme meant to give free services.

The traditional self-help strategy of merry-go-round should be encouraged to enable the local people to purchase bednets more easily. Selling tablets on credit would work well for the poor who cannot afford the medicines when they are sick. There should be a rule requiring the debtors to pay in kind, for instance, using part of their farm products and/or livestock, if they fail to pay in cash after a specified period of time. This approach would enable the village health committee, with the help of the Assistant Chief

to control the defaults on payments.

To improve the people's confidence in the CHWs, they should be trained further and issued with certificates. The training should encompass the management of malaria and detection of cases that would need referral. Volunteer CHWs with secondary school certificates should be encouraged to serve within the Bamako Initiative. On the other hand, more male CHWs should be recruited to supplement the efforts of female health workers in malaria control and general health education. The people should also be made aware of the changing roles of the Nyamrerwa (Traditional Birth Attendants) who have been incorporated into the other PHC activities such as malaria control.

It is also recommended here that periodic supervision and seminars for the CHWs be introduced. This will assist in ensuring that the appropriate malaria management guidelines are followed. Similarly, the Bamako Initiative officials, in conjunction with UNICEF, should help in establishing a referral system for difficult malaria cases.

The village health committee and the other Bamako Initiative officials should ensure that clan politics do not interfere with the performance of CHWs and the people's general participation in the Bamako Initiative activities. In cases of big clan villages, at least, two CHWs should be recruited.

The CHWs should be educated about voluntary community service. Alternatively, they should be offered occasional incentives to motivate them so that they can serve more diligently. If possible, bicycles should be provided to the CHWs so that they can easily reach their clients.

The Bamako Initiative programme should encourage and support the provision of basic information on malaria and its control. The educated residents and young school

leavers can be mobilized for educational activities. Malaria control information can be conveyed in churches, women group meetings, funerals and weekly public meetings (barazas). Malaria control education should also be integrated in the school curriculum with an emphasis on the community-based malaria control efforts. Educating the people on malaria would discourage beliefs, practices and perceptions which militate against the use of the Bamako Initiative services. On the other hand, some of the local notions about malaria-related illnesses should be used to create culture specific metaphors and analogies in the health education messages.

It would be beneficial to set up a community pharmacy in a central place and on public land. The B.I. programme can for instance rent a room at the health centre being put up by Aro women's group and Norwegian donors near Majiwa school (see Map 4). This would be a more accessible centre than the current one. The pharmacy should have a qualified attendant and be open throughout the week. This would supplement the efforts of the CHWs especially regarding prescriptions and diagnosis. The pharmacy should also be stocked with a variety of anti-malaria drugs so that the local people have the same choice as in the shops. Similarly, local shopkeepers should be educated on the management of febrile illnesses, so that they can advice the community members on the correct use of anti-malaria drugs.

The Bamako Initiative should integrate bednet dipping with the dipping of curtains. Most people living in houses without wall partitions and inner doors use curtains as substitutes for the partitions and doors. Dipping curtains in permethrin would help in reducing the human-mosquito contact for those who cannot afford bed nets for the whole family or for those who are yet to buy the nets. Pyrethroid-impregnated nets and curtains

reduce man-vector contact by acting as a physical barrier and by repelling mosquitoes and driving them out of the houses (Bermejo and Veecken 1992). The use of impregnated curtains would be a cheaper measure for many people in Bar Chando sub-location.

Community-based projects to provide clean drinking water should be integrated in the Bamako Initiative activities. Provision of clean water through boreholes or wells would help in reducing the man-vector contact at water ponds or dams. Similarly, the water projects would help minimize stomach problems and febrile illnesses related to the use of dirty water. A reduction of stomach-related problems would give the local people more opportunity to understand and deal with the real malaria problem.

The local people should be encouraged to use the locally available resources to make windows and doors for their houses. This would allow more light in the houses to drive away mosquitoes which rest in dark corners during the day. The people should also be discouraged from leaving wide eaves in their houses. Similarly, cheap window screening material should be provided to reduce the flow of mosquitoes into houses.

For instance, sisal fibres which can be easily acquired in Bar Chando can be used to improvise window screens and eaves curtains which will be effective with regular dipping in Permethrin. A community-based initiative on the use of local material to make beds should also be introduced to increase the local peoples' potential of using mosquito nets.

Finally, scientific studies should be carried out on the local anti-malaria and anti-mosquito plants. If the plants and other traditional resources are efficacious, the people should be educated on their correct use. Such an effort may eventually reduce the costs of malaria control at the local level. On the other hand, the use of non-efficacious herbs, should be discouraged after scientific research has been conducted.

In conclusion, this thesis illustrates that the Bamako Initiative has not succeeded as a community-based malaria control programme in Bar Chando. The programme is not making direct and significant contributions to the malaria problem within the rural ecological setting. Therefore, it needs to be adjusted to the local conditions to reduce and prevent the disease in the community. The B.I. needs to respond to the local capacity to assess the malaria situation and choose appropriate control measures. In this sense, the local people need a combination of health education, awareness campaigns about the B.I. and economic empowerment, so as to sustain the programme. All the existing local resources should be tested and tried to enhance the effectiveness of community Initiatives in malaria control. Finally, the B.I. should seek to motivate and improve popular participation of community members because they are important partners in the malaria control efforts.



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## APPENDICES

### APPENDIX A

#### THE BAMAKO INITIATIVE AND ITS RELEVANCE TO MALARIA CONTROL: ENGLISH QUESTIONNAIRE

##### Biographic Information

1. Sex of the respondent  
1. Male                      2. Female
  
2. Position of the respondent in the household (ask)
  1. Father/head
  2. Mother/head
  3. Mother
  4. Son
  5. Daughter
  6. Other
  
3. How old are you? (probe)
  
4. Which is your religious denomination?
  
5. Can you read and write in any language?
  1. Yes                      2. No
  
6. If yes, which language?
  1. Dholuo
  2. English
  3. Kiswahili
  4. Other (please specify)
  
7. What level of formal schooling did you attain?
  0. None
  1. Primary 1-4
  2. Primary 5-8
  3. Secondary 1-4
  4. Secondary 5-6
  5. College
  6. University
  
8. What do you do for a living? (probe)
  
9. How many people altogether live in this household?

##### Knowledge of malaria, prevention and treatment control services

10. Which is the most serious disease in this area?
  
11. What is the local name for malaria?

12. What causes malaria?
13. How is malaria spread?
14. During which season is there a lot of malaria in this area? (Tick as told by respondent)
1. Dec - Feb
  2. Mar - May
  3. June - August
  4. September - November
15. Is there anyone in the family who is least prone to malaria?
1. Yes
  2. No
16. If yes who is it?
17. Why is he/she least prone to malaria?
18. When did you last have malaria?
19. How did you know that it was malaria?
20. What did you use to treat it?
21. From where did you get the treatment?
22. Have you ever heard or seen any information on how you can identify and treat malaria illness?
1. Yes
  2. No
23. If yes, when did you see/hear the information?
24. Who gave the information?
25. Where was the information given?
1. Clinic
  2. Radio
  3. Baraza
  4. School
  5. Church
  6. Other (Please specify)
26. Are there any projects in this area which help in the control of malaria?
1. Yes
  2. No
27. If yes, name the project(s)
28. What do they do? (probe)
29. What is the use of bednets?
30. Have you ever used a mosquito net?
1. Yes
  2. No
31. If yes, where did you get the net from?

32. If no, why?
33. Is it necessary that the bednet should be dipped in an insecticide?  
 1. Yes  
 2. No  
 3. Don't know
34. Who should dip bed nets in an insecticide?  
 1. Women  
 2. Men  
 3. Community health workers  
 4. Anyone  
 5. Don't know
35. Who needs the bednet most?  
 1. Children  
 2. Women  
 3. Pregnant women  
 4. Everybody  
 5. Men  
 6. Other (please specify)
36. Why?
37. Which is the appropriate season to use mosquito nets?
38. Why?
39. What are the problems of acquiring nets?
40. What are the problems of using bednets?
41. Have you ever used chloroquine?  
 1. Yes                      2. No
42. If yes, where did you get it?
43. If no, why?
44. Is there any need to follow instructions written on the tablet packets or those given by health workers?  
 1. Yes                      2. No
45. Why?
46. What problems do you encounter in using malaria treatment drugs?

#### ETHNOMEDICAL PRACTICES

47. Are there any herbal medicines that are used to treat malaria illness?  
 1. Yes  
 2. No  
 3. Do not know
48. If yes, which herbal medicine(s)? Please describe how they are used.

49. Is there any curative effect in herbal medicines used to treat malaria?  
1. Yes                      2. No
50. Please explain the herbal effect
51. Are modern malaria medicines similar to traditional medicine in any way(s)?  
1. Yes  
2. No  
3. Do not know
52. If yes, explain
53. Can prayers heal malaria illness?  
1. Yes  
2. No  
3. Do not know
54. If a person has malaria should he/she first see a medicineman?  
1. Agree  
2. Disagree  
3. Do not know
55. Why?
56. How often have you been using medicinal plants and other traditional medicine to treat any illness?  
1. Once  
2. Sometimes  
3. Always  
4. Most of the time  
5. Never
57. When do you take anti-malaria drugs?
58. When do you visit a health centre in case of malaria illness?  
1. When locally available drugs do not help  
2. When advised by a medicineman  
3. When advised by spouse  
4. After instructions from a CHW  
5. Other (Please specify)
59. Do you continue using the tablets even after you have started feeling better?  
1. Yes  
2. No
60. Why?
61. Does malaria kill?  
1. Yes  
2. No
62. Do you think everybody in the family should have a bednet?  
1. Yes



2. No

63. Why?

64. When a person has malaria, should he/she be taken to hospital immediately?

1. Yes
2. No
3. Do not know

65. If yes, why?

66. Is the mosquito a dangerous insect?

1. Yes
2. No
3. Do not know

67. Do you know of modern ways to prevent yourself from mosquito bites?

1. Yes
2. No

68. If yes, which preventive methods do you know?

69. Is it necessary to take malaria medicines when you have no symptoms of the disease?

1. Yes
2. No
3. Do not know

70. Is malaria a serious problem for pregnant women?

1. Yes
2. No
3. Do not know

71. Does malaria medicine harm a pregnant mother?

1. Yes
2. No
3. Do not know

72. If yes, how?

#### ACCESSIBILITY TO HEALTH FACILITIES AND SERVICES

73. From where do you get your drugs?

1. Shop
2. Health centre
3. Community health worker
4. Chemist
5. Other (please specify)

74. Why do you prefer this source?

1. Has efficient remedies
2. Is within walking distance
3. Provide cheap medicine
4. Influence from family and friends

5. Other (please specify)
75. How often do you use the Bamako Initiative Services in this area?
  1. Always
  2. Sometimes
  3. Most of the times
  4. Never
76. If never, why?
77. What do you think limits your use of the Bamako Initiative Services?
78. How should the Bamako Initiative services be improved to be accessible to all?
79. When did you last meet a community health worker delivering health services?
80. What health issues did he/she talk about?
81. What were the problems in following (understanding) his/her explanations?
82. What are the domestic needs that would bar you from buying bednets?
83. Would you buy bednets even when you have these needs?
  1. Yes
  2. No
84. Please explain why?
85. In your opinion who should provide the stock of drugs and bednets for the Bamako Initiative in this area?
86. Do you think people should pay for the Bamako Initiative Services?
  1. Yes
  2. No
  3. Do not know
87. Why?

#### PERCEPTIONS OF COSTS AND BENEFITS

88. It takes a lot of time and money to treat malaria illness?
  1. Yes
  2. No
  3. Not sure
  4. Do not know
89. What types of work would you not do when you have malaria?
90. Have you ever incurred any debts due to malaria illness?
91. In case of malaria symptoms, when would you stop working?
92. Can malaria illness disappear on its own?
  1. Yes
  2. No

3. Do not know
93. Can the mosquito population get reduced on its own?
  1. Yes
  2. No
  3. Do not know
94. If yes, how?
95. Which are the non-commercial ways of controlling mosquitoes?
96. Can these methods be used instead of bednets and other commercial mosquito repellents?
  1. Yes
  2. No
97. Why?
98. Who do you think would best serve in malaria treatment and education services in this area?
99. Why?
100. Does a bednet protect you against malaria?
  1. Yes
  2. No
  3. Do not know
101. Do you think the Bamako Initiative benefits everybody?
  1. Yes
  2. No
  3. Do not know
102. If Yes/No why?

## APPENDIX B

### Question Guide For Key Informants

1. Which is the most serious disease in this area?
2. What is the local name for malaria?
3. How do various people in this area explain the cause and transmission of malaria?
4. Do you think everyone in this area is aware of the Bamako Initiative Malaria control activities?
5. What are the limitations for the use of the Bamako Initiative services?
6. Should people pay for the B.I. services?  
Why?
7. How should the B.I. services be improved to be more useful to the local people.
8. What problems are popularly associated with the use of bednets in this area?
9. Describe the traditional methods of treating malaria and keeping mosquitoes away and please name any herbs used.
10. Which other domestic needs hinder the use of mosquito nets in this area?
11. Who do you think would best serve in malaria treatment and education services? Why?
12. Does the B.I. Malaria Control Programme benefit everyone?

## APPENDIX C

### Question Guide For Group Discussion (In-depth Group Interview)

1. What explanations are usually given for the causes and transmission of malaria in this area?
2. Is there any need to take malaria tablets before seeing the symptoms of the disease?
3. Are there any traditional methods of malaria treatment and mosquito control which are still used today?
4. Does prayer heal malaria?
5. What limits the use of the Bamako Initiative services in this area?
6. Does everyone benefit from the BI programme (Probe for reasons)
7. How should the BI services be improved so that they are more helpful to the local people?
8. What prevents many people from buying mosquito nets?
9. What are the problems associated with the use of mosquito nets?
10. Why do many people in this area prefer to go for malaria treatment from the hospital/health centre and other sources than the community health workers?
11. How should the poor be helped so that they can easily use the BI services?

## APPENDIX D

## ETHNOMEDICAL PRACTICES

## TRADITIONAL HERBS USED IN THE TREATMENT OF MALARIA ASSOCIATED AND OTHER ILLNESSES

Luo and Scientific Names	Description of preparation and use	Malaria-associated and other illnesses which the herb cures
<u>Aremo</u> ( <i>Harungana madagascariensis</i> ) (Hypericaceae)	<ul style="list-style-type: none"> <li>- Leaves are rubbed on the forehead</li> <li>- Pounded leaves are mixed with water and solution taken</li> </ul>	<ul style="list-style-type: none"> <li>- headache (<u>wich bar</u>)</li> <li>- flu</li> <li>- stomach-ache</li> </ul>
<u>Akech (or Akech-Akech)</u> ( <i>Vernonia</i> sp)	<ul style="list-style-type: none"> <li>- Leaves are pounded, mixed with water and taken by the patient</li> <li>- Leaves are rubbed on to painful joints</li> </ul>	<ul style="list-style-type: none"> <li>- stomach-ache</li> <li>- joint pains</li> </ul>
<u>Okita</u> ( <i>Ocimum Kilimand-scharium</i> )	<ul style="list-style-type: none"> <li>- Leaves boiled in water in a pot tightly covered when steam start coming out the pot or <u>sufuria</u> is uncovered (lid removed) and the patient does some steam inhalation(fundo/humo)</li> <li>- Roots are boiled and the extract dropped in a child's nose</li> </ul>	<ul style="list-style-type: none"> <li>- Serious colds and coughs</li> <li>- Fever</li> <li>- Body weakness</li> <li>- Convulsions (<u>Sambwa</u>) in children associated with fever and a worm (<u>Kute</u>) in the child's head.</li> </ul>
<u>Bwar</u> ( <i>Ocimum basilicum/Labiatae</i> )	<ul style="list-style-type: none"> <li>- The bark is crushed, mixed with water, or with millet flour porridge and taken, sometimes mixed with tablets</li> <li>- Juice from cooked roots drunk by pregnant women for stomach pains associated with malaria.</li> </ul>	<ul style="list-style-type: none"> <li>- Stomach-ache</li> <li>- Fever</li> </ul>
<u>Ochol</u> ( <i>Alphania Senegalensis</i> )	<ul style="list-style-type: none"> <li>- The roots are chewed sometimes are mixed with <u>Rachier</u> (<i>Croton dichogamus</i>) and <u>Nyabung-odide</u> (<i>Microglossa pyrifolia</i>) and chewed together</li> </ul>	<ul style="list-style-type: none"> <li>- Headache</li> <li>- Cold</li> </ul>
<u>Kwoyo</u> ( <i>Lannea Stuhlmanni</i> )	<ul style="list-style-type: none"> <li>- Leaves mixed with other herbs, pounded, put in water and drunk by the patient</li> <li>- Also leaves and/or bark boiled in tea and taken orally</li> </ul>	<ul style="list-style-type: none"> <li>- Headache</li> <li>- colds</li> <li>- fevers</li> </ul>
<u>Ober</u>  ( <i>Albizia Coriaria</i> )	Bark of the tree boiled and the juice taken by patient	Fevers

<u>Nyabung – Odide</u> ( <i>Microglossa pyrifolia</i> )	<ul style="list-style-type: none"> <li>- Roots are pounded, soaked in water and drunk by the patient</li> <li>- Roots are boiled and the solution taken, sometimes used for steam inhalation under a blanket (<i>fundo/humo</i>)</li> <li>- Solution used to make the patient vomit malaria out through the bitter bile when he/she vomits</li> </ul>	<ul style="list-style-type: none"> <li>- Headache</li> <li>- Cold and body weakness</li> <li>- Also said to treat malaria in general</li> </ul>
<u>Nyalwet Kwach</u> ( <i>Toddalia asiatica</i> )	<ul style="list-style-type: none"> <li>- Roots are chewed and the juice swallowed</li> <li>- Roots boiled in pot and the uice given to the patient</li> </ul>	<ul style="list-style-type: none"> <li>- Stomach-ache</li> </ul>
<u>Ochuoga</u> ( <i>carissa edulis</i> )	Roots are boiled in pot and solution given to patient.	Malaria in general and diarrhoea
* <u>Kevo</u>	Roots boiled and solution given to patient	Malaria in general
<u>Oyieko</u> ( <i>Sesbania sesbana varinubica</i> )	Roots are boiled and solution given to patient	Body pains
<u>Ohuya-Ndawa</u>	boil roots and take orally, chew roots	Colds and fevers
<u>Rabuor</u> ( <i>Erlangea cordofolia</i> )	<ul style="list-style-type: none"> <li>- Leaves are chewed and juice swallowed</li> <li>- Roots mixed with water used to make one vomit out malaria through bile</li> <li>- Crushed leaves rubbed in joints</li> </ul>	<ul style="list-style-type: none"> <li>- Abdominal pains always described as stomach ache</li> <li>- Joint pains and swellings</li> </ul>
<u>Dwele</u> ( <i>melia azedarach</i> )	Roots boiled and taken in water orally	Fever, especially for children
* <u>Okulbat</u>	<ul style="list-style-type: none"> <li>- Rub leaves at painful part of head</li> <li>- Also roots boiled in air tight container for steam bath</li> </ul>	<ul style="list-style-type: none"> <li>- Headache</li> <li>- Colds and flu (<i>athund'a</i>)</li> </ul>
<u>Rachier</u> ( <i>Croton discogamus</i> )	Usually mixed with others such as <u>Nyalwet Kwach</u> , <u>Nyabungo - odide</u> and <u>ochol</u> , then boiled together. The solution is given to the patient	<ul style="list-style-type: none"> <li>- Stomach-ache and malaria</li> </ul>
<u>And'we</u> ( <i>Kedrostis foetidstima</i> )	<ul style="list-style-type: none"> <li>- Pounded leaves are mixed with water and taken orally</li> </ul>	<ul style="list-style-type: none"> <li>- Skin ailments commonly called <u>yamo</u>, equivalent to body rashes and boils associated with seasonal changes.</li> <li>- Fevers</li> </ul>

Ombasa ( <i>Tylosema fassoglensis</i> )	Mixed with Ochol ( <i>Alphania senegalensis</i> ), boiled then solution given to the patient	- After diarrhoea that follows use, general malaria is cleared
Oluor - chieng (Ageratum Canyzoides)	- Extract from boiled leaves or roots is taken (drunk) by the patient - Leaves rubbed in forehead incisions ( <u>saro</u> )	- Stomach ache - coughs - Headaches - Bleeding - Swollen bruises
Sogo – maitha ( <i>Fagara macrophylla</i> )	- Dried bark is chewed and juice swallowed - The bark may be scrapped off, dried and ground into powder. The bitter powder may be taken in small quantities in a cup - Decoction of leaves is taken orally	Cures malaria in general and associated illness including: - fever - stomach ache - joint pains - flu
* <u>Nyadema</u>	Pounded leaves are mixed with water and taken orally	Headache
* <u>Atipa</u>	- Pounded leaves soaked in water becomes red as blood. The bitter solution is taken regularly by the patient. - Root decoction is also drunk warm	Headache
Manyas – Olele ( <i>Dissotia irringiana</i> )	- Boiled roots' solution taken in two mugs - Pounded leaves smeared on body	- Headache - fever - flu - stomach ache
<u>Katera</u> ( <i>Cissus rotundifolia</i> )	- Used as a spice	- Rashes on the skin and other swellings known as <u>yamo</u>
<u>Tangaus</u> ( <i>Zingiber officinale</i> or Zingiberaceae)	- Taken in tea or porridge	- flu and colds ( <u>athund'a</u> )
Atek – <u>Tagwari</u> (Also called <u>Nyabende-Winy</u> ) ( <i>Lantana camara</i> )	Rub leaves on forehead	- Headache
* <u>Nyatigo</u>	Leaves are pounded and rubbed in incisions made on the forehead	Headache
<u>Olandra</u> ( <i>Cissampelos Mucronata</i> )	Roots are uprooted, boiled in water and the solution taken by the patient orally	- Stomach ache and general stomach and abdominal pains
<u>Rayudhi</u> ( <i>Gardenia</i> )	Mixed with Roko ( <i>Erythrina excel/sa</i> ) roots and boiled in water. The solution is taken while still warm by the patient	- headache - stomach ache



<u>Abaki</u> (Warburgia Ugandensis)	Drie bark is ground and the powder mixed with strong tea then taken orally. Also bark or leaves boiled and conchthon orally	<ul style="list-style-type: none"> <li>- Weak joints</li> <li>- Colds and flu</li> <li>- Fever and increasing body</li> <li>- Temperature</li> <li>- (<u>del maowore</u>)</li> </ul>
<u>Roko</u> (Erythrina excelsa)	<ul style="list-style-type: none"> <li>- Parts of the branches and bark are chewed.</li> <li>- Also used to brush teeth, an action that is believed to enable the user swallow some juice from it to cure illnesses.</li> </ul>	<ul style="list-style-type: none"> <li>- headache</li> <li>- believed to prevent one from malaria in general</li> </ul>
<u>Ohingla – tiang'</u> (cassia occidentalis)	<p>Roots are chewed and the bitter juice swallowed</p> <ul style="list-style-type: none"> <li>- Roots are crushed and mixed with cold water. After the particles have settled, the clear solution is given in small quantities to the patient.</li> <li>- The leaves are boiled in water and the patient does steam inhalation in an air tight blanket or sheet</li> <li>- Leaves are rubbed directly on the body</li> </ul>	<ul style="list-style-type: none"> <li>- Severe stomach ache</li> <li>- Fever</li> <li>- Colds and flu (<u>athung'a</u>)</li> </ul>
* <u>Obuo – Madongo</u>	Dry roots are ground and the powder taken on a palm or between two fingers is sniffed as it is with tobacco sniffing. This leads to snizzing and mucus flow through the nose	<ul style="list-style-type: none"> <li>- Headache</li> <li>- Colds and flu (<u>athung'a</u>)</li> </ul>
<u>Nyabende Winy</u> (Lantana Camara)	See <u>Atek Taqwari</u>	See <u>Atek Taqwari</u>
<u>Pedo</u> (Harrisproa abyssinica)	<p>A decoction from boiled roots is drunk as a medication for various ailments.</p> <ul style="list-style-type: none"> <li>- Also fruits, which are edible are considered as medicine</li> <li>- Boiled in air tight pot for steam inhalation</li> </ul>	<ul style="list-style-type: none"> <li>- Fever.     - flu</li> <li>- Nausea     - feeling cold</li> <li>- Vomiting (<u>ng'ok</u>)</li> <li>- Stomach ache</li> <li>- Shivering (<u>tetni</u>)</li> </ul>
<u>Ochwaa</u> (Tamarindus Indica)	Roots are boiled in a pot and the decoction drunk by the patient	<ul style="list-style-type: none"> <li>- Coughs</li> <li>- Fevers</li> </ul>

Source: Own fieldwork November 1995 - February 1996, NB. Scientific Names RE: Kokwaro 1976, 1972

\* Luo names whose scientific names were not found.

## APPENDIX E

### TRADITIONAL HERBAL MOSQUITO REPELLENTS

1. Atek - taqwari (*Lantana camara*)\*
2. Bap - Karadali (*Eucalyptus spp*)
3. Osuno, or Osunosuno (*Leonitis spp*)
4. Bondo (*Candelabrum Kotschy*)
5. Mieny, or Mueny (*Ocimum basilicum*)
6. Bwar (*Ocimum basilicum (Labiatae)*\*)
7. Anyach, or Anyach - anyach (*Tagetes minuta*)

\* Herbs which are used for malaria treatment and mosquito repelling.

All the above herbal repellents are used for smoking the inside of houses to repel mosquitoes. Mieny, Osunosuno and Anyach are also crushed, mixed with water and then sprinkled in the house for an effective scent to keep mosquitoes away. They can also be hang around the houses and removed when the scent is finished. Bap-Karadali and Bondo are sometimes used to produce a lot of smoke to keep mosquitoes away as well as reinforcing the effect of burning cowdung.

Source: Respondents and key informants during fieldwork.