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DISSERTATION

EVALUATION OF THE INSECTICIDE TREATED BEDNET PROJECT IN THE BUILSA DISTRICT OF THE UPPER REGION OF GHANA

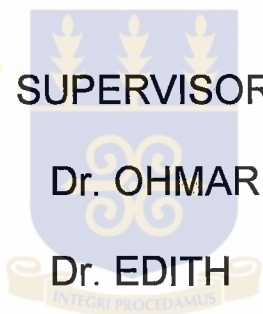
PRESENTER:

Dr. EMMANUEL LAWRENCE ANAGLATE

ACADEMIC SUPERVISORS:

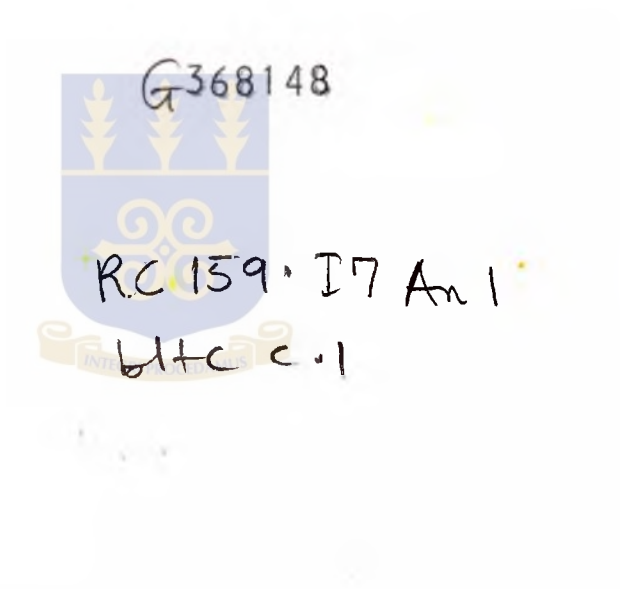
Dr. OHMAR AHMAD

Dr. EDITH TETTEH



PRESENTED TO THE SCHOOL OF PUBLIC HEALTH IN
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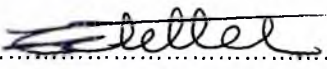
DECLARATION

No one can be held accountable for the contents, results and arguments presented in this dissertation which are my own ideas. All sources of references or otherwise, however, have been duly acknowledged. I wish to declare that this dissertation has neither in whole or in part been presented for another degree.

Signed:

Dr. Emmanuel Lawrence Anaglate  Date. 30/12/02
(SPH RESIDENT)

Dr. Ohmar Ahmad  Date. 18/01/03
(ACADEMIC SUPERVISOR)

Dr. Edith Tetteh  Date. 13/01/03
(ACADEMIC SUPERVISOR)

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To all my Research Assistants I say thank you very much. To the School of Public Health and its entire staff I say thank you very much.

Thank you all and God bless you.

DEDICATION

This work is dedicated to my late parents ,my wife Naomi, my children Wosime,Mawuse,Sitsofe,Dodzi and Bernice Ama for their love,tolerance, understanding,inspiration and support; also to my brothers and sisters for their inspiration and support.

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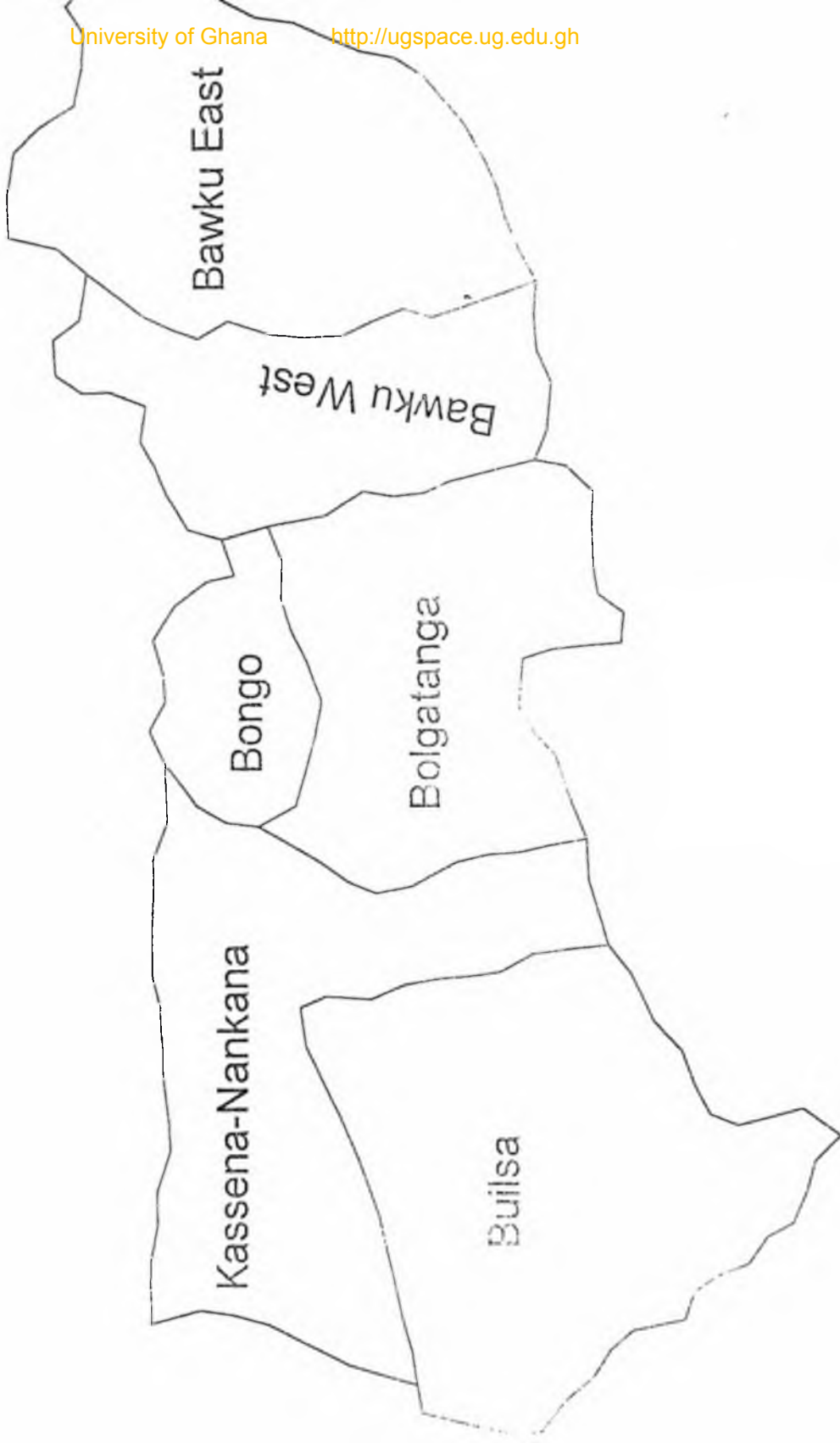
LIST OF ABBREVIATIONS

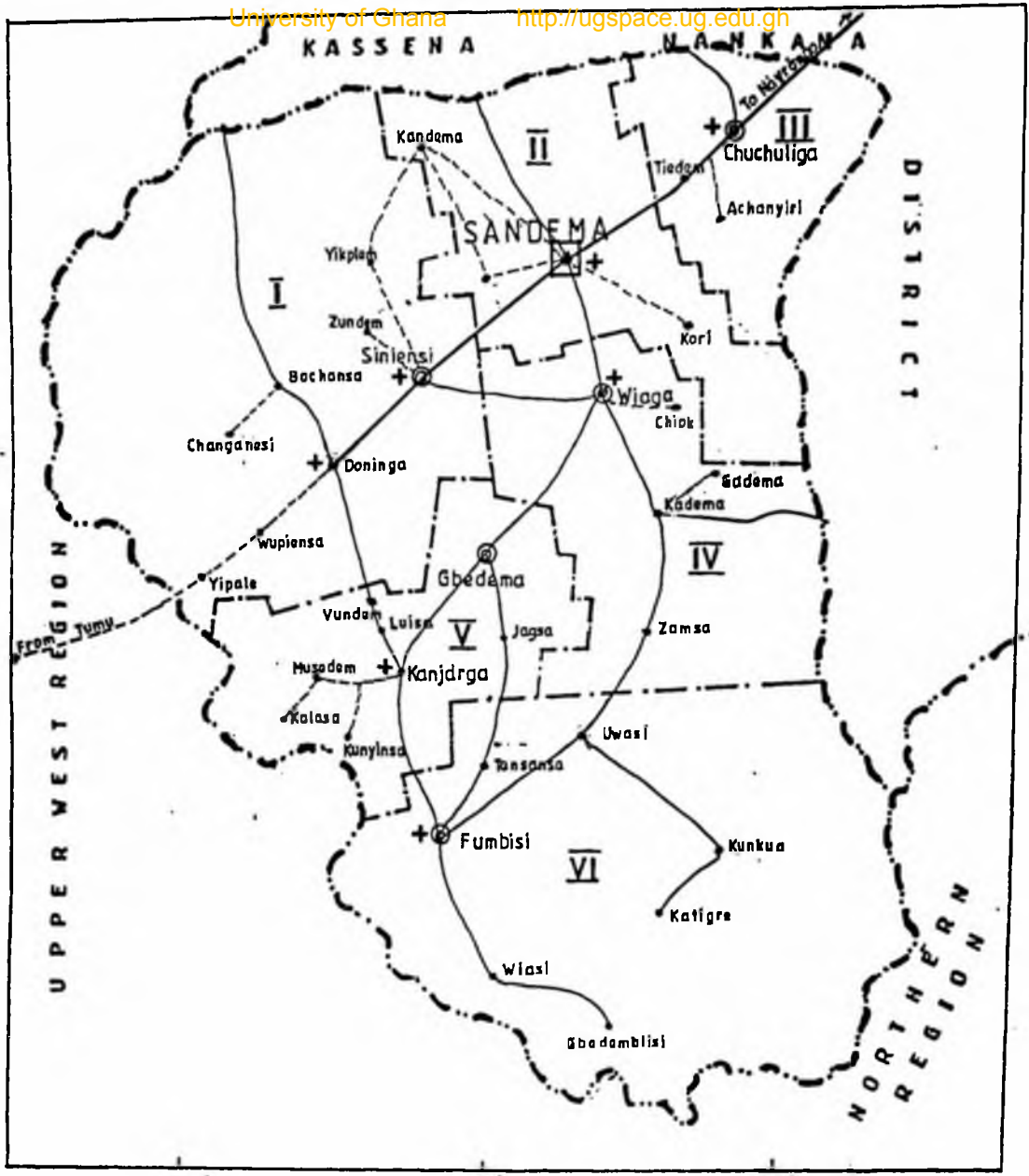
ANC	-	Ante-natal Care
CWC	-	Child Welfare Clinic
DCD	-	District Coordinating Director
DCE	-	District Chief Executive
DDCO	-	District Disease Control Officer
DDHS	-	District Director of Health Services
DDT	-	Dichloro-Diphenyl-Trichloroethane
DHA	-	District Health Administration
DHMT	-	District Health Management Team
DITBC	-	District Insecticide Treated Bed net Committee
IDI	-	In-depth Interview
ITM	-	Insecticide Treated Materials
ITN	-	Insecticide Treated Net
KII	-	Key Informant Interview
MOH	-	Ministry of Health
OBN	-	Ordinary Bed net
RA	-	Research Assistant
RDHS	-	Regional Director of Health Services
OPD	-	Out Patients Department
UNICEF	-	United Nations Children's Fund
VAP	-	Village Action Process
WHO	-	World Health Organization

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MAP OF UPPER EAST REGION

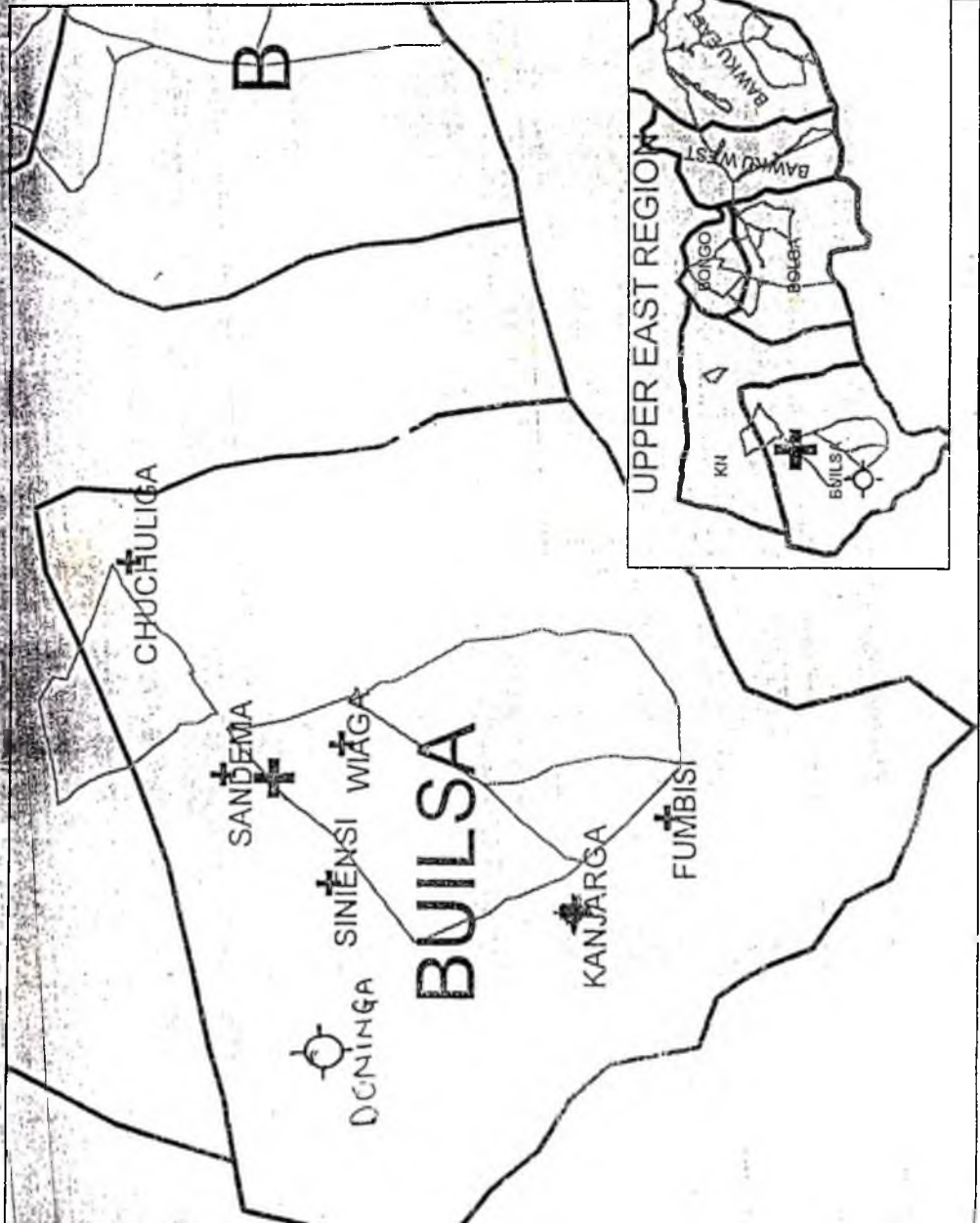




LEGEND

- | | | | |
|-----------|------------------------|-----|-------------------------|
| ----- | DISTRICT BOUNDARIES | ● | TOWNS |
| - - - - - | SUB-DISTRICT BOUDARIES | — | ROADS |
| ◻ | DISTRICT CAPITAL | I | SINIENSI SUB-DISTRICT |
| ⊙ | SUB-DISTRICT CAPITALS | II | SANDEMA SUB-DISTRICT |
| + | MAIN MARKET CENTRES | III | CHUCHULIGA SUB-DISTRICT |
| | | IV | WIAGA SUB-DISTRICT |
| | | V | GBEDEMA SUB-DISTRICT |
| | | VI | FUMBISI SUB-DISTRICT |

CHANGES WITHIN BUILSA DISTRICT 1998



Layers

DISTRICTS



ROADS



HEALTH CENTRES
HOSPITAL



HEALTH CENTRE
UNDER CONSTRUCTION



KM



ABSTRACT

Builsa District is the largest of the six (6) districts in the Upper East Region with a population of 75,072 people. Malaria has been one of their major problems of public health importance as noticed nation wide. The incidence of malaria was found to be 290 per 100,000 population and accounted for about 48% of all OPD attendances and about 42% of admissions in the Builsa District for over a period of five (5) years.

The bed net programme is being promoted in the Upper East Region and Builsa is one of the districts where UNICEF introduced the programme in 15 pilot VAP communities in 1999 under the Integrated Community Based Development Programme.

This study was conducted to determine the extent of effective use of the bednet in the district and factors that affect the smooth implementation and failure of the project in the district, the communities' knowledge on causes and prevention of malaria, factors that affect the acquisition of the ITNs and retreatment. A descriptive, cross-sectional study using both qualitative and quantitative methods for data collection and analysis was done. Structured survey questionnaires, In-depth and Key Informant interviews were used.

Three hundred (300) respondents were interviewed from the fifteen (15) VAP communities which were in the programme since 1999. Fifty (50) new communities were added at the time data collection was started.

About 86% of the respondents know of malaria and its prevention, willingness to acquire the bed nets is about 96% but only 30% were willing to pay 13,000 cedis

outright for the nets. 78.9% of the pregnant women and 34% of children under 5 years sleep under the nets where available. 54% of the respondents know that the bed nets should always be used once acquired. About 72% of the bed nets were clean and hung but not retreated.

Monitoring, records keeping, intersectoral collaboration, the communities' attitude, the sales agents, and the mode of payment were identified as factors that affected the smooth implementation and sustainability of the programme. There were shortages of insecticide in 8 out of 12 months in a year in the district. Monitoring was poor as a result of lack of logistics and motivation. The sales agents were not selected by their communities, had no guarantors, and were not trained for the project at the Navrongo Research Centre as planned. Sales agents were not accounting for sales made regularly. The community members were either not paying regularly or not at all.

There was lack of cohesive collaboration between the District Assembly and the District Health Management Team.

Sales agents should be properly identified by their communities and should have credible guarantors. The sales agents and the sub-district coordinators should be financially motivated. A coordinated intersectoral collaboration between the health sector and the District Assembly for the close monitoring of the project regularly. The Bed net Project account should be separated from the Integrated Community Based Development Programme common fund.

CHAPTER ONE

1.0 INTRODUCTION

Malaria is a disease for which specific treatments have been known but still a problem for and a challenge to human development. Control of malaria has never been easy because it needs to be adapted to local circumstances. People at greatest risk are pregnant women, children under five years, refugees and displaced persons. Among the four species of the genus *Plasmodium* that occur in man, *Plasmodium falciparum* is most lethal. There are three species that are responsible for malaria in Ghana. These are *Plasmodium falciparum* (80-90%); *Plasmodium malariae* (20-36%) and *Plasmodium ovale* (0.15%)^{7,13,19}

The emergence and spread of chloroquine resistant *Plasmodium falciparum* parasites (Afari et al, 1992) has generated concern about the feasibility of controlling malaria through programmes relying on prompt diagnosis and treatment alone. Renewed attention has, therefore, been directed to assessing the potential benefits of insecticide impregnated bed nets in response to the need for low cost preventive measures.

Bed nets have been used as protection against nuisance insects, dust and roof debris and for privacy. Nets, curtains and clothing impregnated with insecticides were used during the Second World War to protect from malaria and other vector-borne diseases.^{2, 9} In the 1950s DDT impregnated mosquito nets were also used for malaria control but abandoned in favour of residual house spraying in the context of malaria eradication.^{9, 18}

The potential usefulness of insecticide treated mosquito nets for malaria control was reconsidered early in the 1980s with the advent of biosafe and photostable, synthetic pyrethroids. The use of pyrethroid treated mosquito nets has been a major part of the integrated approach to malaria control in the WHO West Pacific Region (notably China) since the mid 1980s.^{2,7,8} Studies have since been conducted on the short-term efficacy of pyrethroid treated nets on malaria vectors and diseases in many parts of the world.^{3,5,8,15} Field trials in Africa, completed in 1996, have shown significant opportunities for improvement of child survival.^{3,5} Studies of insecticide treated nets in The Gambia, Ghana and Kenya have indicated that appropriate use of insecticide treated mosquito nets can reduce mortality among children aged 1 – 4 years by 17 – 33 percent (average 25%) depending on the site and overall child mortality by 17 – 63%.^{3,5,8}

In the Kenya study, insecticide treated nets reduced death rate by 44 percent, lowered the hospitalization rate of children with malaria by 41 percent, and reduced childhood death rates from all causes by 33%. In Ghana's northern savannah, where malaria transmission rates are even higher, insecticide treated nets reduced childhood death rate by 17%.^{2,3}

Many factors influence whether insecticide treated nets (ITNs) achieve widespread acceptance and use. Among them are access to netting and insecticide for re-treatment, affordability of the bed nets, and public education on the use bed nets. Also essential is improved national political and policy environments, refinement and adaptation of insecticide treated bed net to specific circumstances and methods of use, and increase in the knowledge base required

to support the design and implementation of insecticide treated bed net programmes; and the development of public health, communication tools and strategies to support national programming. The ultimate goal is to save lives by reducing the malaria burden especially among the under 5s and children of school going age, pregnant women and also help improve productivity.

1.1 BACKGROUND

In Africa, malaria is responsible for about 20% to 30% of hospital admissions and about 30% to 50% of outpatient consultations. In Sub-Saharan Africa, malaria is a major public health problem constituting about 9% of the total continental disease burden. ^{2,7}

Completed studies (Alonso et al,1991;Binka et al,1997) have shown that insecticide treated materials are generally accepted by communities even where they are not commonly used, and are able to repel mosquitoes even in areas where there is insecticide resistance. They are more cost-effective than indoor residual spraying, and can be successfully integrated in most other health and development intervention programmes and community development activities.

In Ghana, a hyperendemic country, malaria is the single most important cause of morbidity, constituting some 40% of all out patient department visits and about 25% of all under 5 years old mortality.^{13,19} In the Builsa District, malaria constituted 48% of all outpatient department attendance in the year 2001. This situation has been about the same since 1996 even though the district implemented the national strategy. ^{23,24}

Malaria control in Ghana, as in line with the global control strategy, currently involves four (4) strategies,¹³ as follows:

- ❖ Early diagnosis and prompt treatment of malaria cases;
- ❖ Planning and implementation of sustainable preventive measures which involves the following: environmental manipulation to reduce and/or eliminate mosquito breeding sites; reduction of man-vector contact by using insecticide treated bed nets as an integrated control, coordinated with health and non-health development programmes;
- ❖ Regular reassessment of ecological, social and economic determinants of malaria with focused research and improved dissemination and utilization of the results;
- ❖ Functional partnership involving partnership mechanisms between departments and agencies such as UNICEF and Ghana Social Marketing Foundation to prevent/reduce man-vector contact by promoting/using insecticide treated bed nets.

Even though these strategies are implemented in the Upper East Region, as elsewhere in Ghana, malaria is still the number one disease of public health concern in the Builsa District. The incidence of malaria in the district was about 290 per 100,000 population.^{23, 24} In 1999, under the Integrated Community Based Development Programme (ICBDP), UNICEF in a joint collaboration with the District Assembly and the Ministry of Health introduced the ITN programme in

the Builsa District. The Ghana Social Marketing Foundation and the Navrongo Bed net Project are also promoting the bed net in the district.

The idea behind bed net project is to reduce malaria transmission by reducing man-vector contact. The project also aims at providing the nets and the insecticides at an affordable cost and to generate a revolving fund so that the District Assembly could buy more bed nets and insecticide. The project can then be extended into the other communities within the district.

1.2 STATEMENT OF THE PROBLEM/RATIONALE

The incidence of malaria in the Builsa District in 1996 and 1997 was 290 per 100,000 population, and constituted 48% of all out-patient attendances and 42% of mortality in children. The trend was about the same for four years (1997-2001)^{23, 24} (Sandema District Hospital Records 2001)

UNICEF introduced the insecticide treated bednets in 15 selected (VAP) communities in the Builsa District in 1999, as a preventive tool to reduce the incidence of malaria and save lives, after a qualitative survey was conducted in 1998.^{23, 24}

UNICEF officials, the District Assembly, the DHMT/MOH and the Village Action Process team members of the 15 pilot communities in the Builsa District agreed on the following sub-activities before the project started.

- i. All participating communities were to identify and select project contact persons, preferably the Assembly member or a sub-chief of the area.
- ii. A team of 3 to 5 people were to be selected from each of the pilot communities to be trained at the Navrongo Health Research Centre on how to treat the bed nets.
- iii. Communities were to identify storage facilities for the bed nets and the insecticide.
- iv. A storekeeper and a sales agent were to be selected to manage the stock and supervise sales of the bed nets and the insecticide in the pilot communities.
- v. A District Bed net Committee was to be formed to supervise and monitor all project activities in the Builsa district including the management of project accounts.

UNICEF supplied 7,800 of the untreated bed nets in different sizes with 36 litres of insecticides in 1999 and the DITNC started implementing the programme.

Reports and records reviewed revealed that the principles and policies for the smooth implementation of the ITN programme as outlined above were not adhered to and, therefore, created lapses and problems that hindered the smooth performance of the Bed net Project in the district as well as its sustainability. These problems are mainly community based, managerial, and financial as outlined below.^{23, 24}

1. Community based problems.

The communities were not buying the bed nets when the modality for payment was outright. When payment was changed to payment by installment they were not paying regularly, or were not paying at all after their initial deposits.^{23,24}

2. Managerial problems

There were lapses in the distribution of the bed nets, coordination of the project, documentation at the central store and at the community level there was lack of proper records on the whole project, lack of effective monitoring system and shortage of insecticide for retreatment of the bed nets.^{23,24}

3. Financial problems.

There were no records of monies paid to community treasurers for the bed nets sold, especially during the period when the bed nets were paid for by installments. The bed net project account was kept in a common fund, the Integrated Community Based Development Programme (ICBDP) account making it possible for the bed net project fund to be used for other purposes.

The District Disease Control Officer (DDCO), the District Director of Health Services (DDHS), the District Planning Officer (DPO), who is the chairman of the District Insecticide Treated Bed net Committee (DITNC) confirmed

the above problems. The District Chief Executive has indicated the need to evaluate the Bed net Project in the District since a new phase of the project needed to be launched.

The Builsa District is aiming at increasing the utilization of the insecticide treated bed net in the district by 20% by the end of the year 2002 as a component of malaria control programme and also to improve child survival in the district. ^{23,24} The Regional Director of Health Services also requested the evaluation of the project to enable him replicate the project in other communities in the Builsa District and other districts not yet covered in the region.

An evaluation of the project is necessary to generate data for the Builsa District and the Upper East Region to replicate and sustain the project.

As a result of time constraints and inadequate financial resources the study attempted to examine the managerial and financial aspect of the problems superficially, and devoted more attention to the community based problems.

The study, therefore, attempted to find answers to the following questions:

- ❖ What roles did the programme managers (District Assembly, DHMT, DITNC, VAP Team members) play in the planning, designing, and sustainability of the project?

- ❖ What were structures and mechanisms put in place for the acquisition of the bed nets, insecticide and retreatment, and for cost recovery?
- ❖ To what extent were the community members involved in the acquisition of the bed nets, in cost recovery and sustainability of the project?

1.3.0: OBJECTIVES OF THE STUDY

1.3.1: General Objective

To evaluate the Insecticide Treated Bed net Project in the Builsa District with emphasis on community based factors that contributed to its failure.

1.3.2: Specific Objectives

To determine :

- i. The mechanisms in place for acquisition of ITN ,insecticide and retreatment;
- ii. The extent to which ITN were acquired and level of use in the communities;
- iii. The effectiveness of mechanisms in place for cost recovery and sustainability of the ITN project.
- iii. The roles of DITNC members in planning and designing the project with emphasis on management and monitoring.

1.4.0: BACKGROUND INFORMATION ON THE STUDY AREA

Bulsa District is the study area, which is one of the six (6) districts in the Upper East Region of Ghana. It has six (6) sub-districts, one hundred and thirty-seven (137) communities, a projected population of 75,072 (Bulsa District Profile, 2001) and a growth rate of 2.7%. The district is the largest in the region with a land surface area of 2,205 sq. km with a population density of 34 persons per sq. km. The district exhibits a dispersed settlement pattern and small settlement sizes.

The district is bound in the north and east by the Kassena-Nankana District of Upper East Region, in the south by West Mamprusi District of the Northern Region and Sissala District of the Upper West Region in the west.

Sandema is the district capital and the only urban center. It has a population of 16,233. The district is almost homogenous with regards to ethnicity. The Bulsa tribe who are the indigenes form about 89% of the entire population. The remaining 11% consist of other tribes like Kantosis (settlers from Togo), Mamprusi, Sissala, Nankani, Mossi and Akan.. The people are predominantly traditional worshipers (72.4%), Christianity(15.3%, Islam (10%) and other religions(2.3%). (Bulsa District Assembly, 2001). The Sandema town and few of the villages are connected to the national grid for electricity supply.

1.4.1: Economic Activities

The main economic activity is farming. The Builsas are traditionally subsistence farmers, depending more on their crops than livestock for food (Builsa District Assembly, 2001). Commercial activities are primarily petty trading besides pito brewing. Commercial rice farming is also done in the valleys in the southern part of the district which is a good breeding ground for mosquitoes and, therefore, responsible for the malaria incidence in the district. The economic activities in the district affect the ability of the inhabitants to buy the nets.^{23, 24}

1.4.2: Transportation and Communication

The main road linking Navrongo-Sandema is about 29 kilometers. About 19km Navrongo-Sandema and about 1km Sandema-Navrongo are tarred, leaving a portion about 9 km untarred. Access to most of the communities in the heart of the district is by traveling along a foot or bicycle path. The flat terrain may permit the use of vehicles to some of these communities during the dry season.

Within the district and between sub-districts communication is by hand, public address systems or megaphones and messages sent by mouth and through town criers (with the permission from the chiefs and opinion leaders) and in mosques and churches.

This makes it very difficult for health programmes to be carried out effectively, especially monitoring programmes like the bed net project.

1.4.3: Education

The population is predominantly illiterate with a district literacy rate of 15% for both sexes (Bulsa District Assembly, 1999). It would have been easier to have effective health education programmes if the literacy rate were to be higher.

1.4.4: Health Facilities and Staffing

The district has a Government (District) Hospital, a Presbyterian Rehabilitation and Orphanage Center, a Maternal and Child Health/Family Planning Clinic in the Sandema town, four (4) health centers in the sub-districts (Chuchuliga, Fumbisi, Kanjarga and Wiaga) and a Community Clinic in Siniensi. The district has three (3) doctors (1 Ghanaian and 2 Cuban doctors) all at the Sandema Sub-District Hospital, thirty-one nurses (4 public health, 13 midwives, 10 Community Health/Enrolled Nurses and 4 Medical Assistants) and 280 paramedical staff. The doctor population ratio is 1:30,000 and nurse population ratio 1:1,500. Sixty percent 60% of all health staff including all doctors is found in the Sandema town, the remaining 40% distributed in the health centers at the sub-districts. The inadequate staffing and the inequitable distribution of health facilities makes quality health care delivery and health education very difficult.

1.4.5: Climate

The district experiences a wet season between April – October and dry season between December – March. It is during the rainy season that anopheles species, vectors for malaria, multiply in their numbers in the district. This accounts for the high malaria cases for OPD attendance averagely (48%) and admissions (42%) in the hospital from January to December for the past five years 1997–2001 (Sandema Hospital Records, 2001). During the rainy season, roads to the sub-districts and their communities are also not motorable for monitoring the bed net project which was started in 1999 under the Integrated Community Based Development Programme as a joint collaboration between UNICEF, District Assembly, and MOH.

The rationale of the project is to reduce the high incidence (290/100,000 population) of malaria which was attributed to poor environmental sanitation and low utilization of ITNs in the Builsa District.

The programme was piloted in 15 VAP communities after a 5 member District Bed net Committee was formed with members drawn from Ministry of Food and Agriculture, Ministry of Health, Community Development, and Controller and Accountant General Department to implement and monitor the above project.

All participating communities were to identify and select contact persons, and select 3 to 5 members of the communities to be trained on treatment and retreatment of the bed nets at the Navrongo Research Centre, as well as identify their storage facilities.

However, when the project finally took off it faced the following problems and challenges, besides the inaccessible road network to the sub-districts during the rains:

- ❖ Inadequate supply and shortage of insecticide for treatment and retreatment;
- ❖ Weak and ineffective monitoring of the programme;
- ❖ Lack of motivation for sales agents, community volunteers and programme managers; and
- ❖ Poor stores management and documentation.

CHAPTER TWO

LITERATURE REVIEW

2.0: Malaria Burden and Use of Insecticide Treated Bednets

There are 1.5 to 2.7 million deaths from the 300 to 500 million cases of malaria cases that occur in the world every year. Greatest at risk, are children under the age of five as well as pregnant women. ²

The malaria burden poses a big challenge to human development. The Global Malaria Control Strategy recognized that there is no single prescription for the control of malaria in all areas and that the approaches have to be tailored to each unique epidemiological situation and based on the realistic assessment of control needs and risk factors. This is to prevent mortality, reduce morbidity and social and economic losses by strengthening national capacity. ^{2, 7, 20, 21} UNICEF and WHO, in support of the campaign against malaria is promoting the use of insecticide treated bed nets in high risk areas targeting especially children under five and pregnant women. The goal is to have all children under five years in the high risk areas sleeping under the insecticide treated bed net by the year 2010 (UNICEF, Facts and Figures, August 1998).

In Vietnam, bed nets are widely and successfully used as a component of national malaria control strategy, including epidemic prone areas; in China, millions of such nets have been used routinely for many years; in the Solomon Islands, the use of bed nets has sharply increased over the past few years, resulting in a dramatic reduction in malaria. (WHO Expert Committee on Malaria

12th Report, 2000 Technical Report Series 892). The general experience is that this intervention, along with appropriate education is highly acceptable, even in populations that do not traditionally use bed nets

Since 1992, the Solomon Islands have reduced their malaria problem by 61% using the insecticide treated bed net programme in line with the Global Strategy's case management. ²

In Sub-Saharan Africa, the use of insecticide treated mosquito nets and other treated materials is gradually increasing, with a shift from project-based to operational implementation. Programmes based on the use of insecticide-treated materials have been successfully implemented in many areas of the WHO Western Pacific region (WHO Expert Committee on Malaria 12th Report, 2000 Technical Report Series 892).

Susceptibility of the vector *Anopheles gambiae* to permethrin reduced following the installation of bed nets with permethrin (0.5g) per square metre in four (4) villages in Kenya (Vulule J. M., 1994)

In The Gambia, Alonso *et al.* (1992) showed a 63% reduction in all-cause mortality for children aged 1-4 years in areas where impregnation of nets was introduced and D'Alessandro *et al.* (1995) later reported a 25% reduction in all-cause mortality in children aged 1-9 years within a national insecticide impregnated bed net programme.

In Ghana, similar trials carried out by Binka *et al.* (1997) in Navrongo indicated a 17% reduction in all-cause mortality and a 22% reduction in malaria specific mortality in children aged 6 months to 4 years.

2.1. Knowledge on Use and Benefits of the Insecticide Treated Bed nets

The communities will accept, treat their bed nets and use them if they perceive the direct benefits of doing so. ¹⁸

Many published reports focused on morbidity and mortality trials while fewer research findings considered acceptability, availability and affordability of the insecticide treated bed nets which affect their effective use in communities in different endemic, economic and socio-demographic settings. ⁴

Control programmes have often overlooked the role communities' knowledge, attitudes, perceptions and behaviour about the benefits of using the ITN to control malaria. ^{1,9} These are important to assess before the introduction of the insecticide treated bed nets since it has been found that knowledge of the cause of malaria was low in some surveyed communities. People were more concerned about mosquitoes being nuisance than as cause malaria infection. Malaria was also treated by a number of traditional practices including herbal remedies. ⁹

The human and economic costs of malaria are enormous. In addition to the expenses of consultation, treatment, hospitalization and travel, malaria often leads to low productivity and lost of income from days of work missed. Sleeping under ITN is a proven method of cost-effective prevention of malaria. Special strategies needed to deliver subsidized ITN to vulnerable populations in rural areas where malaria and poverty are most severe must aim at optimizing the use of ITNs. (Ettling M. *et al*, 1994).

More recently, the WHO Roll Back Malaria (RBM) initiative called for a 30-fold increase in ITN use. Population Service International/Malawi responded with an ITN social marketing initiative and the project expanded to become the first national ITN programme in Africa. The project is reducing malarial disease and death by increasing ownership and appropriate use of ITN. The programme does this by creating demand for and improving access to affordable bed nets and insecticide. (Lengeler C. *et al*, 1998).

In Benin and Cote d'Ivoire, cooperatives are now sewing and selling insecticide treated nets. This promotes the use of nets, and creates employment. Since the ITNs can be re-used, they are expected to be less expensive in the long term than the combined cost of other prevention methods and treatment, including anti-malarial drugs (to which malaria parasites are becoming increasingly resistant), insecticide sprays, coils, and traditional control methods.

2.2 The problems and challenges of Insecticide Treated Bed net Projects.

Low rates of net retreatment with insecticide are a problem to all ITN projects. Some of the notable constraints are; poor brand awareness; perception that a net without insecticide provides sufficient protection; failure to remember that nets need retreatment and well-established response of purchasing drugs for malaria treatment rather than means for prevention. (Lengeler C. *et al*, 1998). It will be necessary to launch an annual, three-month retreatment campaign to coincide

with the start of the rainy season and the increase in the mosquito population.

The challenges to the success of ITN initiatives include the following:

- ❖ the high rate of malarial transmission in rural areas where purchasing power is lowest;
- ❖ the sparse distribution outlets in rural areas;
- ❖ availability of harvest-derived rural income only after the peak period of malaria transmission; and
- ❖ the fact that young children and pregnant women, who are most vulnerable to the debilitating effects of malaria, do not have preferential access to ITN within the household.

These equally apply in the Builsa District where the average income per household is low (about 56% of the population earn below 100,000 cedis per month) and the distribution outlets are sparse.

In Malawi responsive marketing strategies which were used to meet these challenges include the following:

1. Segmenting the ITN market by increasing access to ITN while maximizing cost recovery. This was achieved by selling different products at different prices through outlets to different target groups;
2. Targeting subsidies through rural public clinics where subsidized ITNs were delivered to vulnerable populations in rural areas where malaria and poverty are severe. This could be done in the Builsa

District if the programme could be tied to ANC and CWC attendances to increase the averagely low immunization coverage and to improve defaulter tracing in the district;

3. Creating demand for and promoting the appropriate use of ITN, whereby, communication strategy was used to highlight the health, financial, and emotional cost of malaria; the exclusive role of mosquitoes in transmitting malaria; the risk groups who suffer most and the importance of using insecticide treated bed nets all year round.

Communication messages were developed to address research findings on the primary reasons, both in terms of knowledge and attitude, for not purchasing the ITNs.²⁵

CHAPTER THREE

METHODOLOGY.

3.1 STUDY TYPE/DESIGN.

This is a descriptive, cross-sectional study using both qualitative and quantitative methods for data collection and analysis: *Structured survey questionnaires, In-depth interviews, and Key Informant Interviews* were used as outlined below:

3.1.1 *Pretested structured questionnaires* were administered on a representative sample of the communities which were not included in the project. Besides background information of the respondents, the survey was to cover all issues of interest as outlined in the study objectives. Questions were both closed-ended and open-ended.

3.1.2 *In-depth Interviews*: -Various opinion leaders (political, traditional, religious), heads of Health Sector, District Assembly, Village Action Process Team leaders, were interviewed using open-ended interview guide to help the interviewer and note-taker stay on course during the sessions. This was to determine their views on how the ITN project should be implemented in the district and their plans for acquisition of the nets and insecticides and factors affecting the implementation of the project.

3.1.3 *Key Informant Interviews*: -Compound heads/spouses were targeted to find out their views on how the ITN should be implemented in the communities and their interest in sustaining the project.

3.2 SAMPLING METHOD AND PROCEDURE

3.2.1 STUDY POPULATION

The study involved heads of compounds, mothers with children under five years, pregnant women, opinion leaders in the selected communities, heads of Health Sectors, the District Chief Executive, the District Finance Officer, the District Planning Officer, some Village Action Process (VAP) team members, the treasurers, and some members of the District Insecticide Treated Bednet Committee

3.2.2 SAMPLE SIZE DETERMINATION

Sample size was determined using computer software Epi-Info version 6.0 programme; adapting WHO EPI 30-cluster sampling approach.

Assuming that the statistical acceptability proportion of the Builsa district population for 18 years and above is 45% (i.e 45% of 75,072 = 33,783); the expected frequency of those with knowledge and ability to purchase the ITN being 25% and the worst acceptable rate is 20%, using a confidence level of 95% gives an adult sample size of 288. This was rounded up to 300. Key Informant and In-depth Interviews were conducted to supplement findings from questionnaire survey within the constraints of time and financial resources.

Sample size from 15 communities = 300 respondents from 1320 houses. Using a simple proportion, the 300 respondents were selected randomly

using a Casio calculator after numbering the houses. (Table 3.1/3.2) The same sample size was used by UNICEF in a recent survey conducted in these communities. At the time of data collection 50 new communities have been added to the project but sale of bed nets had not started and so were not included in the study.

TABLE 3.1**SUB-DISTRICTS AND NUMBER OF COMMUNITIES SELECTED**

SUB-DISTRICTS	POPULATION	No OF COMMUNITIES /SUB-DISTRICT	No OF COMMUNITIES SELECTED	No OF RESPONDENTS INTERVIEWED
Wiaga	18,157	33	5	100
Sandema	16,233	27	3	60
Fumbisi	12,583	24	1	20
Chuchuliga	10,162	17	2	40
Gbedema/Kanjarga	10,157	18	2	40
Siniensi	66,64	18	2	40
TOTAL	75,072	137	15	300



TABLE 3.2**THE 15 COMMUNITIES INVOLVED IN THE PROGRAMME****1999- JUNE 2002**

SUB-DISTRICTS	COMMUNITIES SELECTED
Wiaga	Gobsa
	Chansa
	Zarinbulba
	Banyansa
	Sinyansa
Sandema	Kalijiisa
	Kandema
	Abelyire
Fumbisi	Kasiesa
Chuchuliga	Namonsa
	Azug-yire
Gbedema-Kanjarga	Goluk
	Musedem
Siniensi	Guuta
	Dogninga

3.2.3 DATA COLLECTION TECHNIQUES/QUALITY CONTROL

- Reports on work done earlier and other information on the project were reviewed. ^{23,24}
- Interviews were conducted using structured survey questionnaires, In-depth Interviews, and Key Informant Interviews were conducted (see appendices for tools). Tape recorder was used for recording during the KIs and IDIs and notes were taken.
- Research Assistants (4) were trained thoroughly for two (2) days for data collection, note-taking techniques and tape-recorder handling to collect quality data, after explaining the rationale for the study to them.
- Pretesting of survey questionnaires was done by administering the questionnaires in communities not included in the study in order to determine the clarity of the questions and reveal some of the problems that might be encountered during the main study.
- The Principal Investigator did close supervision by going round to check quality of work being done in the field by the Research Assistants, and was present at the Key Informant and In-depth Interviews, and went through the questionnaires each day to make corrections.
- Chosen Research Assistants are able to speak English and the local languages to facilitate good communication with the respondents and Principal Investigator.

3.2.3 DATA COLLECTION TOOLS.

- Checklist on the whole project including utilization of the bed nets and retreatment was used.
- Past records of the District Health Administration, Builsa District Assembly, Sandema District Hospital and District Bed net Committee were reviewed.
- Survey questionnaires, In-depth Interviews, Key Informant Interviews were administered.
- A voice propelled Sony tape-recorder, note-pads, pens and pencils, and a computerized Casio Calculator were also used.

3.2.5 DATA PROCESSING/ANALYSIS

The data collected from the Key Informant and In-depth Interviews, and survey questionnaires were thoroughly checked manually for consistency and completeness. Survey questionnaires were coded, entered and analyzed, using Epi-Info software version 6.0 programme. The information from Key Informant and In-depth Interviews were transcribed verbatim, in cases where the respondent could speak either Buli or Twi, and analysed in line with the thematic content of the study objectives. Descriptive statistical methods was used in the analysis of data such as age, sex, marital status, educational status, occupation and religion.

Distribution of level of knowledge, average family income level and other relevant variables with respect to the set objectives were also analysed. Qualitative data analysis methods were used to analyse data collected from IDIs and KIIs.

3.2.6 ETHICAL CONSIDERATIONS

Permission was sought from the RDHS, DDHS, the DCE, Chiefs, opinion leaders, Assemblymen/women, and husbands of women to be interviewed or their compound heads. With the rather low literacy rate (15%) in the district no informed consents were signed but a verbal consent was obtained before each encounter. In order not to inconvenience the respondents interviews were conducted in their homes and interviewing time was kept at a minimum. Respondents were assured maximum confidentiality throughout the study and thereafter.

3.2.7 IMPLICATIONS FOR STUDY RESULTS

The School of Public Health, University of Ghana, Legon requires the results in the form of dissertation as a prerequisite in partial fulfillment for the award of the Master of Public Health degree. The Builsa District and UNICEF require the findings of the study to help streamline the bed net project in the district. The findings and recommendations will also assist in planning, designing and implementation of the bed net project in other parts of the Upper East Region.

3.2.8 LIMITATIONS

Due to time and financial constraints the study was limited to the 15 selected VAP communities using the bed nets. The period of data collection also

coincided with the rainy season and this made it very difficult to reach all the communities. Launching of the second phase of the bed net project in 50 new communities also made data collection a bit difficult.

3.2.9 VARIABLES

The dependent variable is Insecticide Treated Bed net(ITN)

The independent variables are:

- .Background variables ;
- .Knowledge-associated variables;
- .Socio-cultural and attitudinal variables;
- .Practice-related variables, and
- .Service-related variables.

Dependent variable: Effective use of the bed nets, i.e

- Always sleeping under the bed nets once they are acquired.
- Pregnant women sleeping under the bed nets always.
- Children under five years sleeping under the bed nets always

Independent variables:

- Age, Sex, Marital Status, Religion, Occupation and Education.
- Cost of the nets and terms of payments
- Availability of the bed nets and the insecticide for treatment/re-treatment.
- Affordability of the bed nets and the insecticide.

1. Age – This determines the adult status of the respondent with the potential of being a parent or becoming one, especially women (15-49 years) . The ITN is a preventive for children under 5 years and pregnant women and age composition was analyzed.
2. Marital status was handled with the same idea as for age above.
3. Sex - To remove sex bias proportion of women to men was analyzed.
4. Educational Status is a confounding variable influencing occupational status, family's monthly income, affordability of the bed nets, perception of malaria and its prevention, and the benefits of using ITN.
5. Religious affiliation was handled to determine whether it has any influence on the respondents' perception and practice using ITN.
6. Knowledge of causes and signs/symptoms of malaria, and its prevention was assessed and related to ITN as a preventive tool.
7. Willingness to buy the bed nets was analyzed vis-à-vis with occupation, family' monthly income, cost and availability of the bed nets.

The indicators used for the evaluation were:

- i. Access to bed nets and insecticide;
- ii. Terms of payment - outright, by installment, availability of credit facilities;
- iii. Availability of insecticide for retreatment;
- iv. Persons using the nets.
- v. Average family monthly income.

CHAPTER FOUR

RESULTS

4.1 Socio – Demographic Characteristics of the Respondents; use and benefits of ITNs

A total of fifteen (15) Village Action Process communities were involved in the study and three hundred (300) people were interviewed. All the six sub-districts were covered. (Table 3.1) The Age, Sex, Marital Status, Educational Status, Occupation and Religious affiliation of the 300 respondents interviewed are presented in Table 4.1

The interviewees comprised of 181 males (60.3%) and 119 females (39.7%). Their ages ranged from 19 years to 80 years with the median and mode ages being 45 years and 35 years respectively.

Fig. 1

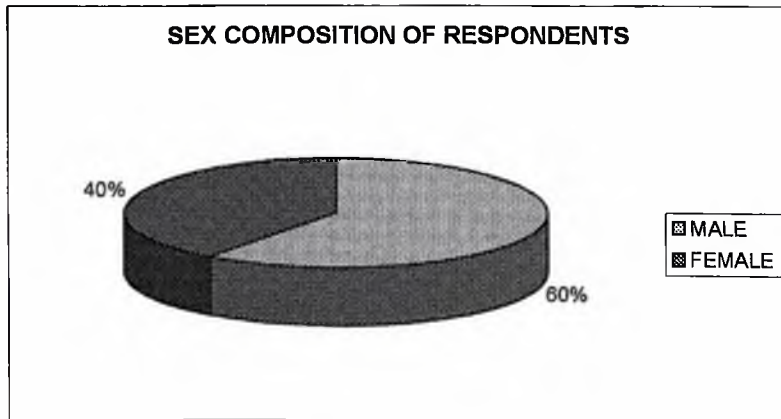


Table 4.1 Socio-demographic characteristics of the 300 Respondents interviewed

VARIABLE	FREQUENCY	PERCENTAGE
AGE IN YEARS		
a. 15 - 19	9	3.0
20 - 24	32	10.7
25 - 29	50	16.7
30 - 34	42	14.0
35 - 39	46	15.3
40 - 44	33	11.0
45 - 49	30	10.0
50+	58	19.3
b. SEX:		
Male	181	60.3
Female	119	39.7
c. MARITAL STATUS		
Married	247	82.3
Single	29	9.7
Divorced	10	3.3
Separated	5	1.7
Widowed	9	3.0
d. EDUCATIONAL STATUS		
Primary	18	6.0
Secondary	25	8.3
Tertiary	14	4.7
Arabic	3	1.0
Technical/Vocational	3	1.0
None	237	79.0
e. OCCUPATION		
Farmer	202	67.3
Trader	54	18.0
Civil Servant/Teacher	32	10.7
Others.	12	4.0
f. RELIGION		
Moslem	14	4.7
Christian	129	43.0
Traditionalist	154	51.0
Others.	3	1.0

Two hundred and forty-seven (247) – 82.3% of the respondents are married, 29 (9.7%) single, 10 (3.3%) divorced, 9(3.0%) widowed and 5 (1.7%) separated.

Out of the total number of 300 respondents two hundred and thirty-seven (237) (79%) do not have any form of education, including 92 females forming 38.8% of the illiterates. Literacy level is therefore about 21%. The major occupation is farming 67.3% and majority of them are traditionalist 68.8% followed by Christians 43.3% mostly of Catholic and Presbyterian background. Most of the educated ones are found in the Sandema sub-district.

Observations

1. Most of the illiterates are traditionalists.
2. All females between the ages of 20 – 39 are still married.
3. The Christians are mainly in Wiaga, Sandema and Chuchuliga

3.2 Knowledge related to cause of malaria

There is a high awareness about mosquitoes and the linkage with malaria. Out of 300 respondents 252 (84%) attributed the cause of malaria to mosquitoes and (259) (86.3%) were able to diagnose malaria by mentioning at least any two of the following: fever, headache, rigors, chills and bodily pains. On prevention of malaria, other methods including traditional ones were mentioned but 88.3% said the use of the ITN is the best and cost-effective method. About 74% of the respondents knew the difference between ITN and OBN. Fifty-four percent (54%) of the respondents mentioned radio as their main

source of information about ITN, about 44% said VAP members and Health Workers, while 1.7% heard about it from neighbours.

Table 4.2 Knowledge Related to causes, prevention and treatment of malaria

VARIABLE	<u>FREQUENCY</u>	PERCENTAGE
Causes of Malaria		
Dust	8	2.7
Hot Sun	14	4.7
Mosquitoes	252	84.0
Hard work	11	3.7
Don't Know	9	3.0
Others	6	2.0
Lay diagnosis of malaria mentioning at least two symptoms		
Correctly	259	86.3
Not Correctly	41	13.7
Prevention of Malaria		
Herbal drugs	5	1.7
Sleeping under mosquito net	265	88.3
Sprays/Coils	15	5.0
Don't Know	10	3.3
Others	5	1.7

<u>Knowledge about ITN/OBN (difference)</u>		
Yes	221	73.7
No	79	26.3
Source of Information on ITN		
Radio	162	54.0
Health workers/VAP members	133	44.3
Neighbours	5	1.7
Effects of the insecticide		
Kills mosquitoes	254	84.7
Others.	47	15.3

The level of awareness of ITN and the benefits of the insecticide in the district could be attributed the radio programmes of the Bolgatanga FM radio station in collaboration with the Upper East Regional Health Administration has been carrying out regularly and the education from the health workers and VAP members.

4.2 System : Sources of supply/availability of ITN and Insecticide

When asked about availability of the bednets 84% said that they are aware and a total of 16% said they don't know. With the insecticide 42% knew about its availability but a total of 58% said they don't know.

Table 4.3 (a) Availability of ITN, Insecticide and Sources of Supply

VARIABLE	FREQUENCY	PERCENTAGE
Availability of bed nets		
Yes	252	84.0
No	30	10.0
Don't Know	18	6.0
Availability of Insecticide		
Yes	126	42.0
No	158	52.7
Don't Know	16	5.3
Sources of supply of bed net/insecticide		
Drug store	2	0.6
Shop	110	36.7
Market	53	17.7
VAP agents	135	45.0
Others.	0	0.0

About the sources of supply 55% mentioned other sources besides the stipulated source of VAP agents. In terms of payment all the 90 (30%) respondent who said outright are all in the Sandema and Chuchuliga sub-districts, the rest 70% are from the other sub-districts.

Willingness to possess the net was 96.3% but affordability in real terms is 32%; an indication that *"if wishes were horses beggars would ride"*.

Table 4.3 (b) Cost, Mode of payment, and Affordability for ITN.

Modality of payment		
Outright	90	30.0
By installment	140	46.7
After harvesting	70	23.3
Cost of the Bed nets		
High	204	68.0
Moderate	20	6.7
Normal	76	25.3
Willingness to have bed net		
Yes	289	96.3
No	11	3.7
Willingness to pay 23,000cedis for ITN		
Yes	89	29.7
No	211	70.3
Affordable amount in Cedis for ITN		
5,000 to 10,000	196	65.3
10,500 to 15,000	57	19.0
15,500 to 20,000	23	7.7
20,500 to 25,000	24	8.0
Average Monthly Income in Cedis		
Below 100,000	167	55.7
Above 100,000	87	29.0
Don't know	46	15.3

The average monthly income per household (in Cedis) for about 56% of the respondents is below 100,000 and 65.3% of them said that they could buy the ITN at any price between 5,000-10,000 Cedis; those who said they could buy the ITN for above 10,000 Cedis were either civil servants or commercial farmers.

4.3 Use/Practice : Household possession and use of ITNs

Out of the 300 respondent 204 (68%) had the net with (180) 60% having one (1) net per household. Total number of female respondent were 119 out which 61 (51.3%) are nursing mothers, 28 (23.5%)(pregnant and the rest 30 (25.2%) not pregnant. The number of pregnant women using the Bed net was 22 (78.6%). Forty-eight (48) of a total of 146 children under 5 years are sleeping under the bednets.

One hundred and forty-six (71.6%) of the net were clean and hanged but only sixty-three (63) 30.9% were retreated at the time of survey and 7.4% (15) of the total nets were torn. Amongst those having the bednets 54% (162) said they always use them while 44.7% (134) preferred only the rainy season. The reason given was the discomfort they during the dry season using the bed nets.

Table 4.3 Use/ Practice: Household possession and use of ITNs

VARIABLE	FREQUENCY	PERCENTAGE
Number of persons per household/compound		
2	11	3.7
3	24	8.0
4	64	21.3
5	89	29.7
More than 5	112	37.3
Total	300	100.0
Number of Women		
Pregnant	28	23.5
Nursing Mother	61	51.3
Not Pregnant	30	25.2
Total	119	100.0

Number of children		
<i>Under 5 - years</i>	584	39.9
Above 5 - years	879	60.1
Total	1463	100.0
Number of ITN per household/compound		
1	180	60.0
2	24	8.0
None	96	32.0
Total	300	100
Number of persons per ITN		
2	96	47.1
3 or more	108	52.9
Total	204	
Number of pregnant women sleeping under the ITN		
Yes	22	78.6
No	6	21.4
<u>Number of children under 5 years sleeping under the ITN</u>		
Yes	197	33.7
No	387	66.3
Total	584	100
Conditions of the ITN		
Clean hung	146	71.6
Dirty hung	28	13.7
Clean not hung	12	5.9
Dirty not hung	3	1.5
Torn	15	7.4
When to use ITN		
Rainy season	134	44.7
Dry season	4	1.3
Always	162	54.0

When to retreat ITN		
Every 6 months	210	70.0
Once a year	19	6.3
Don't know	71	23.7

Out of the total of one thousand four hundred and sixty-three (1463) children found in the survey, five hundred and eighty-four (584) 39.9% were under 5-years; one hundred and ninety-seven (197) 33.7% of these children sleep under the bed nets. The under 5-years are the target group of the project.

All the respondents prefer the large size of the bed nets. The reason is that it is more economical to have large size and, because of inadequate space mother, father and children can sleep under one bed net when necessary.

4.4 FINDINGS FROM KEY INFORMANT INTERVIEWS OF BENEFICIARIES

Answers from the Key Informants - Heads of Compounds/Households, Women with children under 5 years, pregnant women and Community leaders showed a high awareness about the cause of malaria, lay-diagnosis of malaria and its prevention by effective use of the ITN.

As to source of distribution, cost, treatment and retreatment of the bed nets it was revealed that even though there is the will to have the ITN, purchasing was very low. A community leader had this to say *"The sales agent does not come from here. He is in Chana (Kassena-Nankana District) but he kept the nets in a room here and a cripple in*

the house was looking after them. This cripple later broke into the room and stole all the nets.” When asked where the bednets were sent he said “he gave to his girlfriend to sell at Navrongo”

Asked why it happened that way; he said, *“We should have identified and selected our own people as agents.”*

Cost was a barrier to acquiring it; awareness about treatment and retreatment high except the non-availability of the insecticide.

With the cost, a farmer respondent said, *“There is no money, we sell petty, petty things to buy millet and chop. Now this is hunger season. When the nets were between ₵9,000- ₵13,000 we could not buy because there is no money. So if they say ₵23,000 now, where do we get the money, especially a hunger time like this when my millet finish.”*

As to how much he would like to pay he said, *“about ₵5,000 is okay for now. I have to buy food till the next harvesting time.”*

Colour preference meant less to the respondents than the cost and size of the bed nets. Most of them prefer the large size in which at least four (4) people can sleep.

Suggestions by the community members for the sustainability of the project include:

1. Communities selecting their own sales agents to be guaranteed by their fathers, the assemblyman and the chiefs or at least two of them.
2. Enough bed nets and insecticide should be supplied regularly.
3. Sales agents should be trained for treating and retreatment of the bed nets in the communities.
4. The guarantors should regularly check the activities of the sales agents and report the District Assembly in cases of malpractices.

4.6 FINDINGS FROM IN-DEPTH INTERVIEWS OF PROGRAMME MANAGERS

It was revealed from the In-depth interviews with the Regional Director of Health Services, the District Director of Health Services, the District Chief Executive, the District Disease Control Officer, the District Finance Officer, the District planning Officer and some VAP members that the major problems identified with the Builsa District bed net project were poor implementation and ineffective monitoring. In addition, some of the community members either defaulted in payment or refused to pay for the bednets.

In an interview with the DDCO, the District Assembly and/or UNICEF did not provide funds to train between 30-45 selected from the communities in Navrongo according to the Training Guidelines for Sales Agents (Appendix VIII). Instead about 25 of sales agents from the communities were later trained by the eight (8) health staffs (one from each Health Centre and two from the DHA) who were trained in Navrongo.

Regarding implementation there was an initial inadequate education in the communities. Some of them even felt that the bednets were for free distribution and that even the prices were too high. The bednets were also issued in large quantities most of the time and inequitably distributed.

Monitoring was ineffective and visits by the District Bed net Committee had been very irregular. Who was to do what, where and when to do it was not known. Transport was not readily available and fuel supply was a problem. There were no incentives for field staff such as field allowance for monitoring team members. There was no coherent collaboration between the District Assembly and the District health staff hence there was

no involvement of sub-district health staff in the monitoring process as well as the implementation process.

Stores and accounts management procedures were unsatisfactory. The storekeeper doubled both as the District Hospital and the District Health Administration storekeeper. He had problems with inadequate storekeeping stationery including store issue vouchers, store ledger books, community files etc. The non-availability of these materials made it difficult to accurately record stores and sales transactions. Community treasurers had no records or account books.

Sales recovery was low. After 3 years of operation, cash recovered from sale of bednet was only 67.6% (55million) of the value (¢81,360,000) of nets sold out, giving a cash leakage of 32.4%.

For a total of 7,800 untreated net supplied only 36 litres of permetherin was added. This was adequate for only 3,000 bednets for 6 months. There was no record of additional insecticide supplied for retreatment.

In an interview, the District Finance Officer said that monies from the Bed net project are kept in the ICBDP account but admitted that the system put in place for money collection is not one of the best; the reason being that the treasurers were not properly screened before entrusting the job to them and monitoring their activities was difficult and irregular. Forms issued to the treasurers for recording sales were not used because they were not trained to do so.

When the District Finance Officer was interviewed again he confirmed that the contributing factors of the low sales coverage included:

- ❖ Poverty of the people;
- ❖ Unwillingness of the people to pay for the nets purchased based on the misconception that the nets were for free distribution;
- ❖ Weak cash collection system; and
- ❖ Lack of motivation for sales agents and other community volunteers.

In an interview, an official of the District Assembly did not see the reason why the community members cannot pay for the ITN when they spend a lot on alcohol, especially on market days; after selling their animals and farm produce they drink, and then end up beating their wives. He considered it as a misplaced priority.

CHAPTER FIVE

DISCUSSION

Out of the 300 respondents interviewed were 181 males (60.3%) and 119 females (39.7%); their ages ranged from 19 years to 80 years; the (82.3%) of them who are married are all parents.

The literacy rate from the study is 21%, showing a 6% increase from the data of 15% literacy from Builsa District Action Plan 2001. Traditionalist form 51.3% and Christians 43% of the respondents. Farming (67.3%) is the main occupation and about 56% of the respondents earn below 100,000 Cedis a month and this reflects the inability of some of the community members to buy the bed nets.

The most common signs/symptoms of malaria mentioned were fever, headache and diarrhoea; these were also confirmed during the KILs and checklist sessions.

This was in line with findings from other studies done on malaria and ITNs in both northern Ghana ^{4,11} as well as studies from Kenya, Malawi ²⁵ and the Gambia. ^{5,15}

From the results, the total of about 68% of the respondents who were having the bed nets indicates the awareness created about ITN in the district. Out of the 204 who have the bed nets about 85.1% (174) had the un-retreated nets hung indicating that they slept under them the previous night. This was in line with the Gambian ^{5,15} studies which showed that 86% of the adults used the ITNs but were properly treated. This level of proper bed net usage was one of the reasons for the successful implementation of the ITN programme in the Gambia.

The importance of treating the nets before sales cannot be overemphasized. Some of the respondents who expressed interest in individual treatment could be encouraged and trained to do so while preventing poisoning and contaminating the environment. The benefits of sleeping under the ITNs were confirmed on the field where almost all the respondents who had the bed nets said that they no longer fell sick as it used to be in the past when they were not having the bed nets. Some of those who do not have the bed net complained of the high cost.

Interviews with the DITNC members identified the default in payment or non-payment for the bed nets as the major problem with the community members and this was attributed to "*poverty*". It was also realized that monies were left in the hands of treasurers in the communities for too long.

The misconception that the bed nets were part of the free assistance from UNICEF as was in the case of weaning mix and free supplementary feeding for anaemic children made the communities not to buy the nets initially. The DDCO explained that UNICEF has been offering some free assistance in the district so this time too the communities regarded the project materials as free gifts.

When interviewed some of the sales agents and their treasurers said payment for the bed nets by instalment was a problem to them keeping the money. If there were an effective monitoring system with proper documentation this situation would not have arisen. Apart from selling the bed nets the sales agents should have been trained for documentation and simple accounting.

If the programme managers had adhered to the principles and policies for implementing the project besides proper monitoring, the project would have been sustained.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Through well-planned targeting, cross subsidization and cost recovery, an innovative programme in the Builsa District can increase protection of the people annually against malaria and hence meeting their health needs as well as sustaining the programme. Policy makers in the Ministry of Health, Ghana Social Marketing Foundation and other NGOs should, therefore, seriously consider waiving taxes on all imported bed nets and insecticide to encourage the beneficiaries to buy and use the bed nets.

Appropriate education and cross subsidization would have motivated the people of the Builsa District to pay for and use the ITN and hence sustaining the programme. It is very necessary for pregnant women and children under five years to sleep under the insecticide treated bed nets always since using the ITN is a proven cost-effective method of preventing malaria.

Even though the acquisition and usage of ITN in the Builsa District was quite high some members in the communities complained of the high cost of the ITN and wished that the payment by installment be maintained or the cost reduced to an affordable price for outright payment. Some of the respondents expressed the desire of paying after harvest since Builsa is a harvest-derived income rural district. Majority of the community members (over 80%) who got the bed nets through the VAP team

members were paying by instalment while some (about 19%) who had theirs from the shops and paid outright.

Community participation in ITN activities is necessary to increase access to project materials. Even though the supply of the bed nets and, especially, the insecticide by UNICEF was inadequate in the Builsa District the communities too could not pay for the bed nets even when payment was by installment but they expressed the desire to have them.

Non-payment and default in payment by some members of the communities were major problems for the project from the communities' perspective, and inadequate community education and lack of adequate income were the contributing factors. Some members of the communities had the initial misconception that the bed nets were for free distribution.

The inadequate supply of insecticide for treatment and retreatment also contributed to the problems of the project besides mismanagement in areas of records keeping, monitoring, and cost recovery. Leaving monies collected in the hands of the treasurers in the communities for too long only ended up in their using them when in need.

The programme managers at the district level did not follow the agreed principles for running the programme and could have avoided opportunist sales agents by allowing the communities to identify and select their own agents. Interviews with opinion leaders of the communities confirm this. There were situations where some of the sales agents were not residents of the communities. Some of the opinion leaders said they were not made aware that the bed nets would be sold to them. This notion was

compounded by NGOs offering free services in one form or the other in the district. This is an indication that no proper baseline study was done before the introduction of the programme and there was a communication gap between the service providers and the communities.

The bed nets were issued in large quantities (in hundreds) and inequitably distributed. Monitoring was ineffective because transport and fuel were never readily available and there was no field allowance motivation for the monitoring team.

Stores management was poor because the storekeeper had too much to handle and had inadequate logistics to work with. Forms issued to the treasurers for recording sales were not used because they were not trained to do so.

There was no cohesive intersectoral collaboration between the Health Sector and the District Assembly.

Keeping the Bed net Project account in the common account of the Integrated Community Based Development Programme makes it vulnerable to be used for other purposes other than buying more bed nets.

Sub-districts should play active role in implementing the project since there is the need to tie it to ANC and CWC attendances to improve low immunization coverage and defaulter tracing.

There is the need for project sponsors and all stakeholders to come together and redesign the project to suit the specific circumstances in the Builsa District to encourage the beneficiaries in the communities buy, pay for and use the ITNs appropriately. This would go a long way to help achieve the aims and objectives of the programme.

RECOMMENDATIONS

From the results and discussions it is, therefore, recommended that:

1. The DHMT should continue educating the communities through durbars and outreach programmes to sensitize the people and keep emphasizing on the need to sleep under the ITN as an interventional tool which currently offers the best opportunity for cost-effective malaria control.
2. The District Assembly in collaboration with UNICEF should provide funds for the education of the communities if the ITN project is to function well and be sustained in the district.
3. The District Assembly and the DHMT should work in collaboration with each other in the distributing, monitoring the project in the district, providing logistics for, and motivating the monitoring team with field allowances.
4. The DHMT with the cooperation of the District Assembly should train guaranteed community bed net sales agents for distribution, treatment and retreatment of the bed nets, educating the communities, and proper records keeping.
5. The DHMT should tie the acquisition of the bed nets to ANC and CWC attendances for pregnant women and children under 5-years so as to increase the low immunization coverage and improve defaulter tracing. Health workers involved in the ITN promotion must be offered the same profit margin as the commissioned sales agents.
6. The DITNC should encourage the communities to retreat their bed nets and other nets bought from other sources.

7. The DITNC should motivate the bed net sales agents and the sub-district coordinators of the project financially
8. UNICEF in consultation with the DITNC and other NGOs promoting ITN in the district should revise the prices of the bed nets to reflect the average family income of the communities to ensure smooth payment for the bed nets while having in mind the sustainability of the project. Following this, UNICEF should ensure regular supply of the bed nets and insecticide.
9. The DITNC should ensure that payment for the bed nets must be on cash down basis once a reasonable generally accepted price has been fixed.
10. The District Assembly should exhibit sufficient political will to support and sustain the project in the district by providing fuel, transport and fund for field allowances for the monitoring team.
11. The District Assembly and the DHMT should streamline the process involved in the collection of the bed nets from the District Store and control the number of bed nets supplied to an agent at a time
12. Since the Bed net project is a health intervention tool, the DHMT must play the leading role in getting the bed nets to the people and take an active part in the monitoring process.
13. The DITNC members should be committed to the project.
14. There is the need for the project to be re-evaluated after one year since a new phase of the project was started during the current evaluation in order to curtail and avoid the mistakes of the previous phase.

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WORKPLAN

ACTIVITY	WHEN COMPLETED
1. Research Proposal submission to SPH, Legon.	Week 1 - April 26
2. Procuring field equipment and stationary	Week 2 – May 17- May 23
3. Field Activities Consultation with the Builsa DHMT, DA & the Communities, Chiefs and Opinion Leaders	Week 3 - May 24 –May 31
4. Training of Research Assistants.	Week 4 – June 3 –June 10
5. Pretesting of questionnaires	Week 5 - June 11 –June 18
6. Review of instruments.	Week 6 - June 19 – June 26
7. Questionnaires Survey, KIIs, IDIs	Week 7/Week 8-June 27-July 3
8. Analysis of data.	Week 9/Week 10-August 6-August 14
9. Write up and Dissemination of Dissertation.	Week 11–August 15- August 29
10. Submission of Dissertation.	Week 12 -August 30

APPENDIX 1

QUESTIONNAIRE ON INSECTICIDE TREATED BEDNETS:-

Heads of Compounds/Households; Women with children under 5 years/Pregnant Women.

INTRODUCTION

Sometime ago the Insecticide Treated Bednet Project was introduced in your community. Before then you were made aware of Malaria and the benefits of preventing it by using the ITN. I am here to find out how the Project is helping you in this direction so that we can all put our heads together to make the Project better. I hope you will be willing to answer the following questions.

Name of interviewer:..... Serial No:.....

Date:..... Time spent for Interview:.....

SECTION A;(Socio-Demographic)

Name of Community:..... Sub-district:.....

Name of Compound:.....

Name of Compound Head/Household Head:.....

Years in Project:.....

1.Age:.....

2.Sex:..... 1.Male. 2.Female.

3.Marital Status..... 1.Married. 2.Single. 3.Divorced. 4.Others.

4.Educational Status: 1.Primary. 2.Secondary. 3. Tertiary.
4.Arabic 5.Technical/Vocational. 6.None.

5.Occupation: 1.Farmer. 2.Smockweaver.
3. Small-scale trader. 4.Blacksmith.
5.Others specify.

6.Religion: 1.Moslem. 2.Christian. 3.Traditionalist. 4.Others specify.

SECTION B (Knowledge-related)

7(a). Please, what do you know about mosquitoes?

7(b). What causes malaria/fever?

1. Dust. 2. Hot sun. 3. Mosquitoes.
4. Hardwork. 5. Others specify.
6. Don't know.

8. How can you tell that you have malaria?

1. Fever. 2. Vomiting. 3. Headache.
4. Diarrhoea. 5. Don't know.
6. Others specify.

9. How can malaria be prevented?

1. Drugs. 2. Mosquito nets.
3. Mosquito-proof windows/doors.
4. Sprays/Coils. 5. Others specify.
6. Don't know.

10. Have you heard about mosquito nets?

1. Yes. 2. No

11. If yes, where?

1. Radio. 2. Health workers.
3. Village Action Process members.
4. From neighbours. 5. Others specify.

12. Which types have you heard about?

1. OBN. 2. ITN 3. Both. 4. Others specify.
- (Skip Q.13, if the answer to this is ITN.)

13. Have you heard about the Insecticide Treated Bednets?

1. Yes. 2. No.

SECTION C (Attitude-related)

14. Do you sleep under a bednet?

1. Yes. 2. No.

15(a). If yes, which type? 1. OBN. 2. ITN.

15(b). If no, skip Q. 16.

16. Do you feel comfortable sleeping under such a bednet?

1. Yes. 2. No.

17. What do you think is the difference between OBN and ITN, if any? Please state.

18. Which colour of bednet do you prefer?

1. White. 2. Black 3. Yellow. 4. Green.
5. Red. 6. Blue. 7. Others specify.

19. Which shape do you prefer?

1. Cone-shaped. 2. Rectangular-shaped.
3. Square-shaped.

20. Have you heard that chemicals/medicines can be used to treat mosquito bednets?

1. Yes. 2. No.

21. Will it be beneficial to you to treat the bednets with the chemicals/medicines?

1. Yes. 2. No.

22.If yes, why? Please specify: -----

23.How long is the chemical to last after treatment?

- 1.Six months. 2.One year. 3. Two years. 4.Others specify.

SECTION D: (System-related)

24.Where do you/did you buy the bednets?

- 1.Shop. 2.Village Committee. 3.Market.

- 4.Drug store. 5.Others specify.

25.Do you know where to buy the chemical for treatment of the bednet?

- 1.Yes. 2.No.

26.If yes, where?

- 1.Shop. 2.Village Committee. 3.Market.

- 4.Drug store. 5.Others specify.

27.When did you buy your bednets?

- 1.Six months ago. 2.One year ago.

- 3.Two years ago. 4.Three years ago.

- 5.Others specify.

28.Did you buy the chemical/medicine for treatment/retreatment in addition?

- 1.Yes. 2.No.

29. If no, why?-----

30. How many times are you supposed to treat the bednet in a year?

1. Once. 2. Twice 3. Thrice

4. Anytime when necessary.

31. How many times are you supposed to wash the net in a year?

1. Once. 2. Twice. 3. Thrice.

4. Anytime when necessary.

32. How much did you buy the bednet(s)?

33. How did you pay for the bednet(s)?

1. Outright. 2. By instalments.

3. After harvesting. 4. Others specify.

34. How do you think the bednets should be paid for?

1. Outright. 2. By instalments.

3. After harvesting. 4. Others specify.

35. Are the bednets available where you last bought it/them?

1. Yes. 2. No.

36. Is the insecticide for treatment readily available?

1. Yes. 2. No.

SECTION E (Use/Practice-related)

37. Do you have Insecticide Treated Bednets in this house/compound?

1. Yes. 2. No.

37(a). If yes, how many?

1. One. 2. Two. 3. Three. 4. Others specify.

37(b). If no, why?

1. High cost. 2. Not available.
3. No need for it. 4. No knowledge. 5. Others specify.

37(c). May I have a look at your bednet(s) please? (if yes to Q.37)

1. Clean. 2. Dirty. 3. Hanged.
4. Not hanged.

37(d). How many people live in this house/compound?

1. Two. 2. Three. 3. Four.
4. Others specify.

37(e). How many of them sleep under the bednets? (skip if answer to Q.37 is No).

1. One. 2. Two. 3. Three.
4. Others specify.

38. How many pregnant women are in this house/compound?

1. One. 2. Two. 3. Three.
4. None 5. Others specify.

39. How many of them sleep under the bednets? (skip if answer to Q.37 is No)

1. One 2. Two. 3. Three. 4. All of them.
5. None.

40. How many children under 5 years are in this house/compound?

1. One. 2. Two. 3. Three. 4. Four.

5. Others specify.

41. How many of these children sleep under the bednets? (skip if answer to Q.37 is No)

1. All of them. 2. None of them. 3. Two.

4. Others specify.

42. Who actually sleeps under the bednet(s) in this compound/house? (Skip Q.42-48 if no treated bednets)

1. Head of compound/household.

2. Pregnant woman/women.

3. Husband/Wife.

4. Mother/children under 2 years.

5. Children.

6. Others specify.

43. How many children 2-5 years sleep under one bednets?

1. Two. 2. Three. 3. Four 4. Others specify

44. Do they always sleep under the bednets?

1. Yes. 2. No.

45. Which time of the year do you usually sleep under the bednets?

1. Dry season. 2. Rainy season.

3. Always. 4. Others specify.

46. When did you last treat the net after acquiring the bednet(s)?

1. Six months ago. 2. One year ago.

3. No treatment. 4. Others specify.

47. Where was the treatment done?

1. At home (self). 2. Drug store.
3. Community treatment. 4. Others specify.

48. Who would you suggest to treat the bednets?

1. Self. 2. Village committee.
3. Drug store-keeper. 4. MOH staff.
5. Others specify.

49. Did/do you experience any problem using the treated bednet?(skip if no ITN)

1. Yes. 2. No.

If yes, what are they?

50. Do you think using the bednet is/will be beneficial to you?

1. Yes. 2. No.

If yes, what are they?

51. Are you satisfied using the bednet? {skip if no treated bednet(s)}

1. Very satisfied. 2. Satisfied.
3. Not satisfied.

THANK YOU VERY MUCH.

APPENDIX II

Question Guide for IDIs

- ❖ Regional Director of Health Services
- ❖ District Director of Health Services.
- ❖ The District Co-ordinating Director/DCE.
- ❖ The District Disease Control Officer.
- ❖ The District Finance Officer/Treasury.
- ❖ A Village Action Process Team member.

I hope you are aware that UNICEF has sponsored Insecticide Treated Bednets Project as part of its strategy for malaria control in the district in line with the National Malaria Control Programme. These nets have to be purchased and used by consumers, treated and retreated every 6 months.

What strategies have you put in place for:-

- ❖ Purchasing the nets/Cost recovery?
- ❖ Distribution of the nets?
- ❖ Treatment/Retreatment of the nets?
- ❖ Monitoring treatment/retreatment of the nets?
- ❖ Ensuring community participation?
- ❖ Ensuring sustainability of the project in the district.
- ❖ What easy and convenient method of payment can you suggest.

APPENDIX III

Key Informant Interview Guide for:

- ❖ Heads of compounds/households;
- ❖ Mothers with children under 5 years;
- ❖ Community leaders.

1. What causes malaria?
2. What illness do mosquitoes cause?
3. How do you prevent mosquitoes from biting you?
4. Do you find this method effective?
5. What do you know of the bednet?
6. What do you like about the bednet?
7. What do you dislike about the bednet?
8. Are the bednets effective in controlling mosquito bites? Probe.
9. Would you be willing to sleep in such a net? Why?
10. Which colour and shape do you prefer?
11. Would you be willing to buy such a net?
12. How much would you like to pay for it?
13. How many wives and children do you have?
14. How many of the nets can you afford?
15. Where do you think the nets should be sold? Probe options.
16. How do you think the nets should be made effective against mosquito bites?

17. Who do you think should treat the nets?
18. Where do you think the nets should be treated?
19. Who do you think should sleep under the bednet?
20. When do you think the nets should be used? Probe?
21. What would you suggest to be done to sustain the project in the community?

INTRODUCE THE LINK BETWEEN MOSQUITOES AND MALARIA IF THEY HAVE NOT MADE IT THEMSELVES, AND EXPLAIN THE USE AND BENEFITS OF THE INSECTICIDE TREATED BEDNETS.

THANK YOU.

APPENDIX IV

**CHECKLIST ON THE BEDNET PROJECT IN THE BUILSA DISTRICT .
UPPER EAST REGION.**

Station:-----

Status:-----

INTRODUCTION:

I hope you are aware that UNICEF is sponsoring an insecticide treated bednet project in the Builsa district. I am here to find out the benefits and the problems of the project ,if any and then to find out how we can make the project better together.

1.What is this project all about? (objectives and targets:-probe)

2. What do you think of the bednet project?(probe)

3. Do you think there are any problems with the bednet project?

1.Yes. 2.No.

4. If yes, what are they?(but to probe all points below)

- 1.Lack of bednets.
- 2.Lack of insecticides.
- 3.Inability of beneficiaries to buy the bednets.
- 4.Mismanagement
- 5.Others specify

5. Who do you think are the sources of the problem?(probe)

1. UNICEF.
2. Communities.
3. District Bednet Committee members.
4. Health workers.
5. District Assembly.

6. What steps do you think could be taken to solve the problem?(probe)

1. Provide more bednets.
2. Provide more insecticides
3. Train individuals to do the retreatment.
4. Efficient/effective monitoring.
5. Others specify.

7. Suggest what could be done to ensure the efficient/effective running of the project for sustainability(management).

APPENDIX V

**MONITORING INDICATORS FOR THE INSECTICIDE TREATED BEDNET
BUILSA DISTRICT**

1. Percentage of the community members using insecticide treated bednets.
2. Percentage of children under 5 years sleeping under the insecticide treated bednet
3. Percentage of children under 5 years who do not sleep under the insecticide treated bednets.
4. Percentage of pregnant women sleeping under the insecticide treated bednets
5. Percentage of pregnant women who do not sleep under the insecticide treated bednets.
6. Are the bednets and insecticide for treatment/retreatment readily available?
7. Is the cost of the bednets and the terms of payment flexible enough for affordability?
8. Who is using the bednets? Household/compound heads, Mothers/Pregnant women, Children (especially the under 5-years)

APPENDIX VI

MONTHLY MONITORING FORM. MONTH----- YEAR-----

A. AVAILABILITY OF THE NETS

1. Total bednets available during the month. -----
2. Quantity sold during the month. -----
3. Unsold stock. -----

B. FINANCE

1. Value of available stock during the month. -----
2. Value of nets sold. -----
3. Value of unsold stock. -----
4. Amount paid by the community. -----
5. Outstanding balance with the community. -----
6. Amount deposited with the District Finance Officer. -----
7. Cash on hand with the District Treasurer. -----

C. TREATMENT OF NETS

1. Number of nets treated during the month. -----
2. Number of nets due for treatment for the month. -----
3. Amount of the insecticide available during the month (in litres)---
4. Amount of the insecticide used during the month (in litres) ----
5. Balance of the insecticide left (in litres) -----

Adapted from Tamakloe,2002 (Upublished document)

APPENDIX VII

GUARANTOR ONE:

GUARANTOR TWO:

I.....
Have read the terms and conditions
of this offer, have and duly endorsed :

I.....
Have read the terms and conditions
of this offer, have duly endorsed:

.....
To be sales agent of the Builsa district
bed net sale and impregnation project

.....
To be sales agent of the Builsa district
bed net sale and impregnation project

NAME.....

NAME.....

WORK ADDRESS.....

WORK ADDRESS.....

.....
.....
.....

.....
.....
.....

SIGNATURE.....

SIGNATURE.....

HOME ADDRESS.....

HOME ADDRESS.....

.....
.....
.....

.....
.....
.....

RIGHT THUMB PRINT:

RIGHT THUMB PRINT:

DATE.....

DATE.....

Training Guidelines For Sales Agents

◆ **Purpose of the Treated bednet activities:**

To promote the sale and use of ITN for the prevention of malaria among all, but most importantly the vulnerable groups such as pregnant women, children under five and nursing mothers.

◆ **Importance of ITN**

- 1) People, especially, the vulnerable groups sleeping under treated mosquito nets suffer less from malaria than those not using treated nets, and they are less likely to die from the disease and its complications (anaemia, miscarriage, convulsion, etc.).
- 2) The repellent effect of the insecticide means that other people (about five people) sleeping in the same room- though not using ITN- will also benefit. It is similar to, but more effective than spraying the room every night.
- 3) It is also cost effective.

◆ **Management of the insecticide**

- 1) When the insecticide is handled, stored, diluted, and used correctly, they are not harmful to humans.
- 2) Some nets may smell for a few days after treatment, but when the insecticide is used at the correct dilution, there should not be other effects.
- 3) Insecticides can be harmful to fish and other aquatic organisms, so waste fluid from treatment of nets should be poured down a pit latrine- not into a river or pond.

◆ **Types of mosquito nets**

Nets are mostly made of polyester, tent-like (**rectangular, square**) or conical in shape, come in various colours such as white, green, blue or brown, and the size vary from small, medium to large. Others state the size as single, one and half, and double.

◆ **Treatment of nets**

- 1) Equipment required includes a cup, a measuring container, basin, gloves, mask etc.
- 2) Amount of water required is 500mls-1 litre for a new net and 600mls-1 litre for an old net.
- 3) Amount of insecticide required per net varies depending on the type of insecticide used. a) 12ml is required per net if deltamethrin is used and b) 15mls is required per net if permethrin is used.
- 4) Protective gloves must be worn
- 5) Add the insecticide to the water and mix well with a clean stick. Treatment should be performed out-of-doors or in a well-ventilated area.
- 6) Each net should be in its carrier bag, and the insecticide and water solution added. Knead the net well and let the owners carry their net home in the bag.
- 7) **Instructions to the user**

The agent should give the net user the following guidelines:

- a) Drying the net. A net should be dried outside in a shady place. The net should not be exposed to sunlight. Net can also be laid on bed to dry. This will help to kill bedbugs.

- b) A single person should use a small net; two people (an adult and a child recommended) can use a medium/one and half net; two adults or three children can use a large/double net.
- c) A net that is used on a rooftop should be stored in a room during the day.
- d) A net should not be left in rain.
- e) A net should not be used as a cover clothe.
- f) It is **very important** to emphasis **re-treatment of net** in every six months, and before a net is brought for re-treatment it should be washed.

If these instructions are followed properly, a net is expected to last and be effective for a period of at least three years.

- 8) Wash hands and all equipment with soap and water after treating a net(s).
- 9) Pour any waste insecticide and water solution down a pit latrine and not into a river or pond.
- 10) Insecticide should be kept away from the reach of children.

◆ Record keeping

Record keeping is very important for assessment of the performance of agents and the impact of the program.

- a) Must sign the issue and sales return form, and the sales return book after sales.
- b) Record sales and treatment of nets on the return form.
- c) Not more than two nets should be sold to a customer. Record name of user of each net sold.
- d) It is important to record area where a net will be used and not the area of the customer.
- e) Only a single net should be sold to people from other areas, especially the cities.
- f) A net must not be sold without treatment.
- g) Price of net and re-treatment (will be announced soon).
- h) Commission (will be announced soon).

1999.

Date	Community	Quantity of fuel needed	Remarks
21/9/99	Kasiesu Musedem	5 gallons diesel $\frac{1}{4}$ engine oil	
24/9/99	Luntsu Dovinsa	4 gallons diesel $\frac{1}{4}$ engine oil	
27/9/99	Gobesa Chansa Zarinbulba	4 gallons diesel $\frac{1}{4}$ engine oil	
30/9/99	Namansa Azuyeri	3 gallons diesel $\frac{1}{4}$ engine oil	
7/10/99	Kaljiisa Kandema Abelgine	3 gallons diesel $\frac{1}{4}$ engine oil	
4/10/99	Gobuk Banyansa Sinyansa	4 gallons diesel $\frac{1}{4}$ engine oil	

Total number of gallons = 19 gallons = Cost = 77,900

Total number of engine oil = $1\frac{1}{2}$ gallons = Cost = 24,000

Lunch allowance for 4 officers at ₵2,000.00 per day
for five days = ₵40,000.00

Grand Total ₵141,900

Monitoring Team

15/10/99