

## **Chapter IV**

### **Data Exercise**

#### **4.1. Introduction :**

The study aims to prepare a malaria profile of the Panchkhal Village, Nepal by the collection of necessary information on socio-economic and behavioral aspects of people in the village in respect to malaria. The aim is to identify relevant information in respect to malaria transmission. But the aim is neither to establish and determine relationships between socio-economic and behavioral variables with malaria transmission nor to find out significant level among variables and transmission. Therefore, qualitative approach has been used in the study design. The study is a cross-sectional survey to explore the relevant information to develop a malaria information profile.

#### **4.2. Techniques for data collection :**

Techniques for the information collection in the original study will be :

- (1) Interviews with key informants

- (a) Interview with health service provider
- (b) Interview with community people
- (2) Direct observation.
- (3) Semi-structured interviews with household member
- (4) Documents and secondary data (retrospective and service statistics)

### **4.3. Instruments used for data exercise :**

To test the appropriateness of those techniques and pre-testing of interview questionnaire and observation check-list a data exercise was done in Thailand. For the original study, two separate sets of questionnaire guidelines for the key informants interview - one set for health service providers and another for community people have been prepared. This was done for the reason that there are two types of key informants - health staffs and community people and the health service provider and community people possess different degree of malaria knowledge. The questionnaire for health service provider talks about the community. But as a part of data exercise observation of two malarious villages and key informant interview with health service provider were done.

In this connection, interview with health service providers were done with an Epidemiologist and with a Malaria Research Officer at The Office of Vector Borne Disease Control Region 5, Department of Communicable Disease Control, Ministry

of Public Health (MoPH), Bangkok Thailand on 18th August 1997.

Similarly, observation were done at Vector Borne Disease Control Centre 53 in Kanchanaburi Province and in two villages namely Vang Ka-Jae-7 and Kang Pa Lom-1, Malaria Sector 6 Ta-sao, Sai-Yok District, Kanchanaburi from August 7-9, 1997. According to VBDC Centre-53 those villages are malarious areas with forest and forest fringe. During observation the geographical situations and climatic conditions of the villages are found more or less similar to the Panchkhal village of Nepal.

The observation and key informant interview done as the data exercise are the techniques for data collection as intended to use in the original study of Panchkhal village. Interview and observation done were based on the interview guidelines and observation check-list. So this chapter provides an overview on techniques used for data exercise as well as describes the findings of data exercise. This will also focuses that how the data exercise could be helpful in improving the techniques for information collection and pre-test of questionnaire based on lesson learned from the pilot survey.

#### **4.4. Objectives of data exercise :**

An observation and key informant interview done as data exercise was an

exploratory phase of the survey aimed at refining the study design. Thus the objectives of the data exercise were to :

- test the data collection techniques.
- pre-test the interview questionnaire and observation checklist.

#### **4.5. Observation :**

One of the technique to collect data in the original study is observation. So observation was done in those villages. The observation is an important methods for the data collection in the qualitative research approach. The original study aims to identify socio-economic and behavioral aspects and one of the best way to know those aspects are observation. For this reason the technique was used to collect data in the villages. The observation guidelines were used to collect information. Without speaking single words with the people notes were taken from two villages Kang Pa Lom and Vang Ka-Jae, Sai-Yok District, Kanchanaburi Province, Thailand regarding the socio-economic and behavioral aspects of malaria.

##### **4.5.1. Pre-field activities :**

Prior to going to the field a draft study design was prepared through which work could be started. The draft study design was still open to change as and when necessary after data exercise. In this regard correspondences and contacts were made

to The Office of Vector Borne Disease Control, Department of Communicable Disease Control, Ministry of Public Health, Bangkok Thailand. It was known that some villages of Kanchanaburi Province are malarious area and I was suggested to carry field visit for observation in the villages of Sai-Yok District under Vector Borne Disease Control Unit-6, Ta-sao. Dr. Valaikanya Plasai, Department of Communicable Disease Control provided me all the necessary information about malaria situation in that area and managed the field program. Similarly, she managed for key informant interview at VBDC Region-5 where I conducted two interviews.

On 7th August 1997 I went to Kanchanaburi Province. Upon arrival to Kanchanaburi city, a brief discussion was held with Khun Mongkol Thapinkkaw, Chief, Vector Borne Disease Control Centre 53 (VBDC Centre-53), Kanchanaburi and with Khun Phaitun, Chief Vector Borne Disease Control Unit 6, Ta-sao about the purpose of my visit. From the discussion and report of VBDC Centre-53, it was learned that there are 11 districts, 2 sub-districts and 93 tambols in the Kanchanaburi Province. With their help I decided to go Malaria Unit-6, Ta-sao in Sai-yok district among those 11 district because it was not far and accessible by road transport. There are altogether 52 villages in this district.

Out of those 52 villages, two villages namely Vong Ka-Jae-7 and Kang Pa Lom-1 were selected purposively under Malaria Unit-6, Ta-sao as the observation sites and due to the reason that those villages represents high malaria incidences (API

300/1000 and API 140/1000 respectively) and are accessible by road transport. However, the purpose was not to establish the relationships of socio-economic and behavioral aspects with malaria transmission in that village but to get deeper understanding of the phenomena of interest in a variety of situation. The purpose was to look at the village situation to get rough idea about which of information might be relevant to incorporate into profile and how can a malaria profile be prepared so that this experience of the village could be used during original study in Nepal.

#### **4.5.2. Field activities :**

This section shows a description of what were actually done in the field as a sample observation in terms of collecting data and interpreting the findings. Since the primary objectives of the data exercise were to test and refine data collection techniques and pre-test the observation check-list, the following paragraphs will discuss the lesson learned in that areas and will discuss how the techniques could be improved based on these. The following paragraphs will also give an introduction about the natural and artificial settings of the villages and the brief situation of socio-economic and behavioral aspects of the villages.

### 4.5.3. Introduction to villages :

#### 1. Village Kang Pa Lom-1 :

This village is about 13 kilometers away from Malaria Unit-6 Ta-sao, Sai-Yok District, Kanchanaburi. According to stratification done by Vector Borne Disease Control Centre 53, Kanchanaburi, this village falls on perennial transmission (A1) and periodic transmission (A2) area. Vector *Anopheles minimus* is responsible for the malaria transmission there. The weather was hot and humid. The village is surrounded by mountains and situated at the foothill of dense forests. Main agricultural cultivation was corns. The Kwai river is about 1 kilometers away from the village. Surface transportation is available. Majority of people are living on agriculture such as corn and paddy farming and some are related with fishery and woods related (bamboo-cutting and preparing bamboo home appliances) works. Migrants from Myanmar are seen living in the village with corn cultivation by clearing forests.

In this village there are about 50 houses. From 5 houses of the village, data were collected in detail. Five houses were taken for the reason that in the original study sample household size will be the 10 % of the total household of the village. Since I could not get mapping of the village those 5 houses were taken randomly, 3 houses from the middle of village and 2 houses from the entry and end point of village as the representative sample and done by purposive sampling. Observation was

started from the entry point of the village to the end point. I tried to observe as much households as possible. Similarly, village area and living environment were also tried to be observed.

## 2. Village Vang Ka-Jae-7 :

This village is about 8 kilometers away from Malaria Unit-6, Sai-Yok District, Kanchanaburi. According to stratification done by Vector Borne Disease Control Centre 53, Kanchanaburi this village falls on non transmission, high risk area (B1). Vector *Anopheles minimus* and *dirus* are acting together for the malaria infection there. The weather was hot and humid. The village is surrounded by mountains and situated at the foothill of dense forests. Main agricultural cultivation was corns. The Kwai river is away about 2 kilometers from the village. Surface transportation is available. Majority of people are living on agriculture such as corn and paddy farming and some are doing fishery and woods related (bamboo-cutting and preparing bamboo home appliances) works.

In the village there are about 45 houses. From 5 houses of the village, data were collected in detail. Those 5 houses were taken as the representative sample of the village and done by purposive sampling. The similar sampling technique was followed as done in the village Kang Pa Lom-1. Observation was started from the entry point of the village to the end point. I tried to observe as much households as



possible. Similarly, village area and living environment were also tried to be observed.

### **3. Mapping of the villages :**

Mapping is an important work while doing observation in any village. I tried to find out the geographical and political map of villages, but could not. So a rough map of the villages have been drawn during my short stay there. The maps do not imply official approval. The mapping of the villages are given in Appendix V and VI.

#### **4.5.4. Observation findings :**

##### **A. Socio-economic aspects :**

##### **1. Housing :**

##### **a. Condition (outlook) :**

Out of total 10 houses (from where data were collected in detail) of both villages 9 houses were found without windows. Windows were found in one house but screening were not done. Similarly, in neither houses screening of doors were found. The house walls of 4 houses were made up of wood planks and 3 houses with bamboo pieces. Walls of two houses in both villages which were made up of cement and bricks and one with tins.

The roofs of every houses in both villages were slope. The roofs of 6 houses of both villages were made up of tins, cemented roofs in 2 houses, one with coconut leaves roofs and one with straws roofs. Under roofs and in walls of every houses of both villages there were multiple openings and have remained unscreened. Similarly, in both villages, 4 houses did not have walls on all sides (either 2 side or one side opened) of house, 4 houses have walls on all sides and 2 houses were only one side opened. In short, most of houses in both villages have represented more or less same housing outlook as mentioned above.

**b. Demographic census :**

The clusters of households were found scattered in both village. Villages were not densely populated. Similarly, mostly single family size (one family with parents and 2-3 children) were found.

**c. Physical setting (internal) :**

In both villages, the houses that observed have number of rooms two to five. Out of those, six houses have two sleeping rooms and four houses have 1 sleeping rooms. During observation it was found that 3 houses have 1 bed net each, 3 houses have 2 bed nets each and 4 houses have 3 bed nets each.

**Table 4.1 :** Summary of housing of 10 houses

<b>Descriptions</b>	<b>Number of houses</b>
1. Windows :	
- with windows	1
- without windows	9
2. Screening :	
- screening of windows	0
- screening of doors	0
3. Walls provision :	
- walls on all sides of houses	4
- walls on 3 sides (one side opened)	2
- no walls on all sides of house	4
4. Types of walls :	
- walls made of wood planks	4
- made of cement and bricks	2
- made of bamboo pieces	3
- made of tins	1
5. Types of roof :	
- roof made up of tins	6
- made of coconut leaves	1
- made of cement	2
- made of straws	1
6. Sleeping rooms :	
- one sleeping room	4
- two sleeping rooms	6
7. Bed nets :	
- one bed net	3
- two bed nets	3
- three bed nets	4

**d. Surrounding environment and domestic pet :**

In observed houses of both villages domestic cattle were not seen except domestic pets like dog, cock and hen. But in both villages open waste and water disposal around the houses were seen. Water supply was seen by pipes but storage of

drinking water as well as rain water in big oil and cement drums and in big earthen pots were seen. In both villages small natural water canals with slow flowing water near to households were also seen.

## **2. Proximity of apparent or potential breeding sites of mosquito from houses :**

River Kwai with slow flowing water and marginal vegetation is near to both villages. From Kang Pa Lom the river is about one kilometer away while from Vang Ka-Jae it is about 2 kilometer away. In both villages road works were in progress. So, burrows, pools and pits with full of rain water around the roads had seen. No man-made canals or dam were seen except small natural canal around the villages. In the village Vang Ka-Jae one natural pond found lying near to the village on about one kilometer distance. The water of the pond was fresh and had marginal vegetation.

In both villages no wells and taps could be seen. Further observation of mosquito larvae around water sites such as water collection in big pots, pits, burrows and pools were done. But larvae could not be seen except in one house of Kang Pa Lom where mosquito larvae seen into cemented water pots lying around the household premises. Re-checking of some breeding sites for larvae after considerable rain were done, but could not be seen. Both villages were surrounded by dense tropical forest. The proximity of village households to the forest were not more than 50 to 200 meter in distance.

**3. Malaria records (printed on house walls) :**

In every house of both villages insecticide spray record were seen. The spray was mostly done in the Buddhist Era 2540. But malaria treatment card were not seen.

**4. Location and provision of health service and malaria clinic :**

In the village Kang Pa Lom no formal sector health services were seen. But in Vang Ka-Jae there was a government malaria clinic under VBDC Unit 6 Ta-sao and being operated by a government staff. Several malaria volunteers were also seen. They were engaged in insecticide spray in the village. In both villages informal health service provider could not be seen. This might be due to the reason that only observation were done and can not speak with people. Another reason was my inability to speak Thai language and inability to communicate with the people.

**5. Occupation and agriculture :**

Major occupation groups in both villages were farmers, fishers and forest-related workers. Farmers and fishers were working at the day time while I came to know that forest-related workers like wood-cutting and bamboo cutting do their works even in the night time. In village Vang Ka-Jae bamboo related workers were doing their works in the evening also and Khun Phaitun who was accompanied with me told

me that they even used to work all over the night. Both gender were seen at work but majority were male. Main crops in both villages were corns and agricultural fields were near to the households with an average distance of 50 meter approximately.

#### **6. Deforestation :**

During observation period no deforestation activities were seen. This is further supported by the facts that forests was dense. But it was also seen that people in both villages were engaged in bamboo related works and piles of bamboo were seen which might come from forests. In Kang Pa Lom, it was notable that Burmese migrants who were living there with corn cultivation, the cultivation fields were the result of deforestation.

#### **B. Human behavioral aspects :**

During observation people's risk behavior in terms of malaria transmission were tried to be observed. Regarding the treatment seeking behavior it was observed that people were coming to the malaria clinics and staffs were taking blood smears from them and giving drugs to them. At the moment a couple came with a child (about 2 years) perhaps with some illness and the malaria staff took blood smear from the finger of child. Other risk behaviors of people like spending time in the evening and at night for drinking, gambling, wood-cutting etc. could not be observed.

#### **4.6. Key informant interview :**

For the interviews, similar to the observation, correspondences and contacts were made to The Office of Vector Borne Disease Control, Department of Communicable Disease Control, Ministry of Public Health, Bangkok Thailand. Dr. Valaikanya Plasai, Department of Communicable Disease Control managed for key informant interview at VBDC Region-5 where I conducted two interviews. As wished to conduct interview with health service providers in original study, two interviews were done one with an Epidemiologist and one with a Malaria Research Officer at the same offices.

#### **4.7. Key informant interview findings :**

##### **4.7.1. Behavioral aspects :**

###### **a. Treatment seeking behavior :**

Key informants said that people think mosquito nuisance as the problem in the community rather than malaria as a problem. According to them majority people believe that malaria is caused by mosquito but transmitted by water. People used to come malaria clinics with fever for the treatment but self-medication practice is more and use of “*Ya-chud*” (a combination of 3-5 drugs containing anti-malaria drug also and is available in local groceries) is prevalent in the villages. Key-informants said that people usually do not take full course of “*Ya-chud*”.

**b. Personal and family protection behavior from mosquito nuisance :**

Key-informants said that almost all people have bed-nets but not sure that all use it to protect themselves from mosquito nuisance. Sometimes people burn fire-wood for smoking to avoid mosquito nuisance. In some villages about 70% of the people have insecticide impregnated bed-nets but due to it its smell people may not use while sleeping. In the villages some people do not accept DDT spray for the reason that it smells bad, it sometimes kills chicken and bad spot on the walls.

They said that people who work in the forest and spend night in the forest mostly do not carry bed-net with them. Due to hot weather some people do not use bed-net. But some people use protective clothes while sleeping. In some villages there are provision of community financing schemes for the procurement of bed-nets. Key informants said that malaria volunteers and government staffs have created awareness to use bed-nets against mosquito nuisance as a part of anti-malaria campaigns in villages.

**c. Maintenance of surrounding environment in order to reduce mosquito nuisance :**

Key-informants said that village people may not know that poor environmental maintenance like constructing canals and pools, digging pits and



burrows and open water disposal allow water collection and mosquitoes breeds there. People are also not aware that unnecessary burrows and pits should be avoided and proper measures to avoid mosquito breeding in canals and pools should be made by removing vegetation, cleaning water and by the use of larvivorous fishes. Informants said that people do not know habit of mosquito but people know that mosquito live in water and most of the people do not take interest in the environmental maintenance. People know that mosquitoes are dangerous and try to avoid it. They replied that people who work in forests and spend overnight in the forests are risk group.

#### **4.7.2. Socio-economic aspects :**

##### **a. Housing :**

The informants said that in the villages house walls are made up of wood-planks, bamboo and straws where multiple openings can be seen. Neither these openings are screened nor windows or doors are found screened. This situation allow free entry of mosquito within the houses.

##### **b. Occupation :**

According to informants most of the people in the villages are engaged in paddy and corn farming, fruit farming, mining and fishing. People are also engaged in forest related works like wood-cutting and bamboo cutting where they even spend

night. Informants said that forest related occupation is risk occupation.

**c. Migration :**

Informants said that they are not sure about the migration patterns in those areas. But in general local migration is prevalent. People come from other province in order to do some works and earn money. People also come from non-forested areas to the forested areas and engaged in wood cutting works and some migrate from non-malarious areas to malarious areas in order to work in gem-mining etc. A number of Burmese migrant come in Thailand and living in Thai-Myanmar border found suffering from not only malaria but also from Dengue fever and Filariasis.

**d. Irrigation :**

Key informants said that they have no idea about any irrigation provision in Ta-sao, Sai-Yok District.

**e. Deforestation :**

Informants said that due to strict government rules and regulations deforestation activities are under control. But the observation of Kang Pa Lom village gave me a impression that there might have still some deforestation activities. As I

mentioned earlier that the corn fields of Burmese migrants, living in that village, are the result of deforestation. The information received from key informants on this subject matter, therefore, may not be taken as the statement of the real situation

**f. Health education :**

Informants said that people get information about malaria treatment and protection measures from health workers and malaria workers. Malaria volunteers and officials go to village and conduct health education campaign by posturing, mass education, loudspeakers and through mobile malaria clinics.

**g. Availability of health facilities :**

Key informants said that in every village where there is high malaria incidence and transmission there is government malaria clinics which is easily accessible by people. In every villages there are some informal health care provider in the form of traditional healers, injectionist, private practitioner and quacks. They used to treat people against many diseases but informants said that they are not sure about effectivity of the treatment. In village some local groceries and shop-keeper used to sell local anti-malaria drugs. Some people have also behavior of self-treatment.

## **4.8. Interpretation :**

### **4.8.1. Observation :**

From observation and interview with key informants some conclusions could be drawn regarding socio-economic and behavioral aspects of malaria. During observation, I saw most of house-walls in the villages were made up of wood planks and bamboo pieces where there were multiple openings and have remained unscreened. Similarly, neither doors of the houses were screened nor there were walls on all sides. This situation provides mosquito for free entry inside house and rooms. Every houses were found with 1 to 3 numbers of bed-nets in sleeping room. But I could not observed at night whether people are using bed net or not. If they were using during sleeping time this would be a favorable step to interrupt transmission.

In the observed houses domestic cattle were not seen. Animal blood feeder vector like *maculatus* in absence of cattle may feed on human. Open water disposal and collection of water in big earthen pot and drums have provided breeding sites for mosquitoes. In one house mosquito larvae was also seen in the pot with water collection. But I was not sure that the larvae seen were of malaria mosquito since I did not pay attention in floating position larvae. In both the natural water canals with slow flowing water near to households have provided favorable breeding sites for vector.

In both villages River Kwai might also be a good breeding places for malaria mosquitoes since it is flowing slowly and has marginal vegetation. This characteristics of river is favorable for vector breeding. Further it is known that vector can fly up to 2 kilometers for blood meal and the river is within 2 kilometer from both village. The dense forests in both villages have also provided good shelter for forest dwelling vectors like *maculatus* which prefer to feed both on forest animals as well as human being.

Though routine residual spray of insecticide in both villages have become a step to interrupt the transmission. But to the night time forest workers this will not help since it was seen that major occupation groups in the villages were farmers, fishers and forest-related workers. So there is always a possibility of malaria transmission by those workers. Regarding the human behavioral aspects only a little have been observed. This was due to my short stay there and could not spent night in the villages. Though it has been observed that a lot of patients were approaching malaria clinics to test the bloods and to take anti-malarial. Besides those treatment seeking behavior other risk behavior like spending time in the evening and at night for drinking, gambling, working could not be observed.

#### **4.8.2. Key informant interview :**

The perception of people about malaria as a problem indicates that they have

knowledge of disease. But it is notable that people think mosquito nuisance as a problem. To prevent themselves from the nuisance people have bed-nets and sometimes burn fire-wood for smoking to avoid the nuisance which is a personal protection practices. Regarding their belief about malaria as transmitted by water reveals more or less correct coincidence with actual scientific causes. Though they do not seems to be more aware about their risk behavior. Because their practices like water collection in big jars outside the doors and open water disposal around the houses makes small pools which may be a favorable breeding site for vector.

Further, people's self medication practice with "Ya-chud" is a risk behavior which may lead to drug resistance. Because the drug does not contain required full dose and also people do not take full course. It is well recognized that drug resistance is a status which facilitates transmission. People working in forests spending night there do not carry bed nets with them which increase the risk of acquiring malaria infection and may be liable for transmission. People not accepting insecticides spray may raise the risk of transmission. People's behavior to approach with injectionist, traditional healers and quacks for the treatment seems to be risk behavior. Because these people may not have knowledge about scientific treatment method thus facilitating transmission.

Many people in the villages are not maintaining their living environment in order to reduce mosquito nuisance. Several burrows, pits and pools may provide

chances of vector breeding. This behavior might be a factor for the transmission of malaria. Similarly looking at the socio-economic aspects, the housing conditions (made up of wood planks and bamboo pieces with multiple openings but unscreened) is attributable to transmission. Regarding the occupation forests related workers are seems to be at risk. Local migration and cross border migration for the works and earnings into and out from the malaria endemic areas may contribute for transmission. In the areas where data exercise was done migrants from Myanmar are found living there.

#### **4.9. Discussion :**

In villages of developing countries people generally have low socio-economic status. In respect to malaria transmission proper use of bed-nets is a suitable preventive measures and has been found effective since long time. This is the traditional but cheapest and affordable method to interrupt transmission. Method to use the bed nets does not require special knowledge. It only seeks people's awareness in their protective behavior. So people should be motivated to use bed-net compulsorily during sleeping time by health education.

Looking at the housing conditions of villages, entry of vector within house and rooms without any resistance will certainly provide a chance to feed on people and transmit malaria. So screening practice of house doors, windows and other

openings should be promoted. People with low socio-economic status may not afford bed-nets or may not afford bed-nets to every member of houses and screening of doors, windows and openings. For this, efforts should be done to make bed-nets easily affordable and available through intervention like community financing schemes for the procurement of bed-nets.

Furthermore, deforestation practices should be discouraged immediately for the several reasons not only in the context of malaria transmission. The forest vectors feeding on forests animal may turn to human feeder as a result of deforestation.

#### **4.10. Lesson learned :**

The observation checklist were tested and necessary amendments were made. Similarly, interview guidelines were also tested and changes were made. But from observation it was learned that observation should be done during sleeping time to see the use of bed nets and whether all members of family sleep under bed nets. But it is a difficult task and people may not allow to observe at the bed time. For this a technique of data collection, for example, interview with household member, can be added to obtain those information.

In one house of a village mosquito larvae were seen in the water container lying at the household premises. But I could not differentiate it whether it was the



larvae of malaria mosquito or non-malaria mosquito. So, a knowledge to recognize malaria mosquito larvae is essential which I did not have at that time. During the original study, all members of research team will be oriented to provide knowledge on the floating position of malaria and non-malaria mosquito larvae on the surface of water. Further, researcher, with the help of epidemiologist, will prepare a clear picture of floating position of malaria and non-malaria mosquito larvae on water surface and it will be distributed to every members of the research team who engages in observation.

Prior to going for data exercise semi-structured interviews was not incorporated in the draft design. But after observation and key informant interview I felt that without direct talk with household member the actual situation can not be interpreted and observation and key informant interview alone are not sufficient to collect adequate information to develop the profile. Because these techniques alone are found insufficient for the deeper understanding of the situation. For example, the statement of key informants about deforestation reveals that deforestation activities are under control due to strict government rules and regulations. But during observation I felt that people could have been involving in this activities in Kang Pa Lom village. To support this conclusion I realized that triangulation of information is essential because, it raises the accuracy of data that collected. In addition, observation and key informant interview were also found insufficient to examine people's knowledge and preference about malaria control and transmission from

triangulation point of view. So, semi-structured interview as a technique for data collection is incorporated in the study design.

#### **4.11. Limitations :**

The first constraints of data exercise is my inability to speak, read and understand Thai language which caused me to unknown to many things such as inability to know records and service statistics in malaria clinics and people's discussion with one another during observation. This also caused inability to conduct key informant interview with community people and local health workers. Secondly, my stay in the villages was very short. So it made me unable to capture many information about villages which might be possible if the stay was long. For example, I could not watch and understand people's night time behavior; use of bed nets and other anti-mosquito measures by people; and, their cultural regards. It could be said that the observation was not thorough and according to observation norms.

The information received from the interviews conducted with key informants in the Ministry of Public Health could not be generalized for those villages. Because they are central level staffs and may not have micro-level information about the particular villages. But their information could be used as the guidelines for further checking and confirmation. Finally, only two data collection techniques, observation and key informant interview with service providers are tested. But the test of one data

collection technique i.e. semi-structured interview and key informant interview with community people are not done which is another limitation of data exercise.