SOCIAL DETERMINANTS OF INSECTICIDE TREATED BED NET (ITN) USE FOR MALARIA CONTROL AMONG MIGRANT WORKERS IN RURAL AREA OF SHAN STATE IN MYANMAR

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS (HEALTH SOCIAL SCIENCE)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2013

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entitled

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was submitted to the Faculty of Graduate Studies, Mahidol University
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ACKNOWLEDGEMENTS

I would like to express my special thanks to “Supplementary Grant Program Asia”, “Thpyay Education Centre” and “Open Society Foundation” for the scholarship, and the “Faculty of Social Sciences and Humanities”, Mahidol University, for the fee waiver kindly provided.

My special thanks are extended for Associate Professor Suphot Dendong, the head of the department, Associate Professor Luechai Sringernyuang, the programme director, and all the professors and teachers of the Department of Society and Health for their skillful trainings, teachings, hospitality and kind support during the difficult study period in Thailand.

I would like to express my deepest gratitude to Assistant Professor Penchan Sherer, my major advisor, for her patient guidance, encouragement, useful critiques and assistance in keeping my progress on schedule.

I would like to express my very great appreciation to Associate Professor Pimpawong Boonmongkon, my co-advisor, for her assistance with the methodology and the kind teachings.

My grateful thanks are also extended to Lecturer Natthani Meemon, my co-advisor, for her help and critiques.

I would also like to thank the supporting staffs of the Health Social Science International Programme for their support. My thanks are also extended to my friends in Nawnghkio Township in Shan State of Myanmar for their hospitality and assistance during my field trip. My thanks are also for the beekeepers and other informants for the resources they provided for my thesis.

I would like to offer my special thanks and appreciation to Dr May Aung Lin for his encouragement to study in this programme, support provided throughout my study period and useful suggestions for part of this work.

Finally, I would like to thank my father U Khin Maung San, my mother Daw Win Myint, and those who are not mentioned by name, but who I remember, for all kinds of support provided.

Nyi Nyi Aung

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ABSTRACT

Malaria is endemic in the Nawnghkio Township of Shan State in Myanmar. While the local community acquired knowledge of malaria prevention and also received insecticide treated bed nets (ITNs) free from the malaria control project, the high risk group migrant beekeepers were found to have a lack of proper knowledge on malaria and none of them were using ITN. The social determinants of ITN use among the beekeepers were studied from the perspective of critical medical anthropology using the concept of migration.

An ethnographic study was done between July – November 2012 which included in-depth interviews with 25 migrant beekeepers, participant observation, and 4 separate focus group discussions with 6 beekeepers, 7 local villagers, 6 basic health care providers and 3 medical doctors. Content analysis was done.

It was found that the non-profit organization that dominated the health care delivery system related to malaria control in the area, which set the ITN policy, which discriminated against the migrant beekeepers making ITN inaccessible to them. The discriminated social relationship was also observed among the local villagers and the beekeepers. The belief that malaria was caused by drinking unclean water and eating food from the forest, the belief that the bee sting can prevent malaria, the perception of bed nets and ITN, and the economy driven prioritization of success in the beekeeping business, all were found to be leading beekeepers towards poor utilization of ITN for malaria prevention.

A profit making oriented policy of the non-profit organization, the belief system on malaria, prioritization in life, and a discriminatory social relationship in the context of migration were found to be the important social determinants of ITN use among the migrant beekeepers.

KEY WORDS: CRITICAL MEDICAL ANTHROPOLOGY/ INSECTICIDE TREATED BED NET/ MALARIA/ MIGRANT/ SHAN STATE

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LIST OF ABBREVIATIONS

AAA	American Anthropological Association
BCC	Behaviour change communication
CMA	Critical Medical Anthropology
DESA	Department of Economic and Social Affairs (United Nations)
FGD	Focus Group Discussion
GMS	Greater Meakong Sub-region
HMOs	Health Maintenance Organizations
IOM	International Organization for Migration
ITN	Insecticide Treated Bed Net
KIA	Kachin Independent Army
LLIN	Longer Lasting Insecticide Nets
MDGs	Millennium Development Goals
NGOs	Non-governmental Organizations
NTAO	Nawnghkio Township Administrative Office
NTHD	Nawnghkio Township Health Department
PIB	Permethrin Impregnated Bednets
SEA	South East Asia
UN	United Nations
UNDP	United Nations Development Program
VHW	Voluntary Health Worker
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1 Justification

1.1.1 Why study malaria?

Malaria is one of the important infectious diseases affecting and killing many people around the world. An estimated 300-500 million persons suffer from and more than one million die of malaria each year (WHO, 2006b). Malaria causes about 2,414 deaths a day. It is both a disease of poverty and a cause of poverty slowing economic growth by 1.3% per year in endemic areas (WHO, 2004). However, these data are less than the actual data. Exact statistical data on malaria mortality and morbidity are not known because many cases occur in rural areas where majority of the population do not have access to health care services or the ways of availability to health care. As a result, the majority of the malaria cases are not recorded and undocumented (Breman, 2001). Because of this iceberg phenomenon, the problem of malaria is much bigger than documented and should pay more attention than we are doing on it today.

Developing and under developing countries are regarded to be highly affected from Malaria. Africa and the South-east Asia regions are among those which are affected most. Among the SEA countries, Myanmar is the one with greatest morbidity and mortality from malaria. Majority (69%) of country's population is staying in malaria endemic area and half of country's population is staying in areas classified as high-transmission (WHO, 2011). The most aggressive strain of all the pathogenic malaria parasite species, *Plasmodium falciparum*, was responsible for the majority (71%) of reported cases. In the recent years, drug-resistant malaria strains are emerging in the SEA region causing a major threat to the world (Björkman & Bhattarai, 2005; Plowe, 2009; Wernsdorfer, 1994).

Malaria is one of the leading causes of morbidity and mortality and is a major public health problem in Myanmar. Myanmar contributes the majority of malaria cases and deaths in the Greater Mekong Sub-region (GMS), which accounts for approximately twenty percent of the Subregion's population (WHO, 2010).

Malaria, like most of the other communicable diseases, is preventable, but, there are many people who cannot protect themselves being contracted with it. There are social and cultural factors involved in making those people vulnerable to the disease. One of the studies shown that some cultural groups have beliefs related to causation of malaria, because of which it is not rational for them to use bed nets and ITNs to prevent malaria (Alaii et al., 2003). Other studies stated that bed net use is related to socioeconomic forces (Biswas, Hutin, Ramakrishnan, Patra, & Gupte, 2010; Garcia-Basteiro et al., 2011). Poor socioeconomic status was found to be associated with bed net use in these studies. However, a study in Gabon of Sub-Saharan Africa found negative association between socioeconomic forces and bed net use (Goesch et al., 2008). The disease is deeply rooted in the poor communities. The social and cultural dimensions in terms of disproportionate impact on the poor both at the micro- and macro-levels are enormous. Relationship of poverty to lack of education and vulnerability to health risks can be attributed to the disease's deep root in the poor community.

1.1.2 Why study on migrants?

The number of migrants around the world has increased from 150 millions in 200 to 214 millions in 2009 (DESA, 2009) and it is estimated to be raised to 405 millions by 2050 (IOM, 2010). Internal migrant number is 740 million at the same period of time (UNDP, 2009) so the total number of international and internal migrants is just below 1 billion. One main reason behind the global migration movements is the emerging structural feature of the global economy. There was a relatively faster growth of the labour work force in the less developed countries than in developed ones. The projections estimated that the labour work force in the developed countries is going to be stable at 600 million in 2050, while that of less developed ones is expected to raise from 2.4 billion in 2005 to 3.6 billion in 2040 (DESA, 2009). Most of today's migrant workers are coming from Asia (Iravani, 2011).

Migrant groups are often referred to as “vulnerable population” meaning a group at increased risk for poor health outcomes and inadequate health care (Aday, 2001). Illegal status or undocumented position of the migrants, determined by politicians’ policy (Ravinetto, Lodesani, D’Alessandro, Filippi, & Pontiroli, 2009), is the main reason limiting their accessibility to health care services and makes them vulnerable to sufferings. Many of the migrants faces the problem of hard travelling and consequences (injury, dehydration), the difficult working and living environment, the stress from social exclusion, the unpredictability of income, and changes in eating habits (Ravinetto, et al., 2009). All these factors contribute to make them migrants poor and powerless.

In the past, mass population migrations had contributed to the spread of the malaria disease (PROTHERO, 1977). When population migration factor was not taken into account in considering the contributing factors of malaria, 1950s and 1960s malaria eradication campaigns failed (Bruce-Chwatt, 1968). There can be resurgence of the disease when infected people from a malaria endemic area move to an area when there is no disease or where the disease has been eradicated, and vice versa. The malaria prevalence of the areas exposed to mass population migrations were found to be increased (Macgreevy, Dietze, Prata, & Hembree, 1989). However, mass population migration can precipitate the transmission of disease by other means as well. When people move to a new place, their risk for acquiring the disease also increased through the means of changing the environmental situation and introducing the new technology, for example, through deforestation and irrigation systems (Service, 1991). These activities can change the environment to become a more favorable breeding place for *Anopheles* mosquitoes; and at the same time, migrants may have increased exposure to the vector. Migrating people can also transport infectious mosquitoes to previously malaria-free areas, hence reintroducing the disease. Mass population migration is becoming more and more implicated in the spread of drug resistance in malaria (Rajagopalan et al., 1986). Some of the previous studies are pointing out the barriers which prevent migrants to access health services and these include traditional value systems, prolonged hours of working, poor information, and costly services. There was ineffective collaboration between the health system and employers as well. These barriers were partially caused by

negligence of health promotion programmes to be tailored to the migrants (Kim le, Pham, Vu, & Schelling, 2012). Most of these study respondents needed more information on disease and preferred to receive these from their employers since they were commonly working in shifts and were spending most of their day time at work.

Myanmar experienced 56 outbreaks of malaria between 1991 and 2000, most of which were caused by population migration (WHO, 2010). Unemployment with resultant lack of basic needs of life is a major factor which drive people leave their native places and move to places with job opportunities. Most of Myanmar migrants migrate abroad while some are moving to cities in Myanmar where they can work, earn money, raise their families and can have better social support. Some of them migrate to more periphery places, like Nawnghkio Township, where job opportunities exist and living expense is cheaper.

Nawnghkio Township area is rich in natural resources which attract various kinds of businesses, government projects and migrant workers. Many people from other parts of the country come to get a job and work in the area because of the availability of various kinds of jobs. Many are working in agriculture farms whilst others are working as workers in apiculture business, timber production business, charcoal production, lime production, new factories, mines, road construction projects and apiculture farms. The area is also hosting a number of migrants which flew from northern Myanmar to avoid civil war. Nawnghkio Township is hosting 8 convicts' camps in which prisoners are circulating between prisons and camps (NTAO, 2010).

Malaria is affecting many of the rural areas of Myanmar adding a burden on the society. For Nawnghkio Township, malaria is the first priority disease among the top priority health problems in terms of morbidity and mortality (NTHD, 2011). Because of the migrant groups moving in and out of the area, and because of the prison camps, malaria situation is a great challenge for the township health department.

1.1.3 Why study on ITNs?

As Malaria is a major health problem globally, various malaria control activities have been carrying out all over affected areas of the world, and these include prevention, diagnosis and treatment, and health education. Of those activities,

prevention is very effective, is the best and is the major key component of every malaria control programme. Preventive medication, prevention of mosquito bite, and control of mosquito and its larva are three groups of preventive activities being used so far. With the emergence of drug-resistant malaria and new pathogenic strain, *Plasmodium knowlesi* (Lau et al., 2011), preventive medication is less popular. According to the nature of habitat of the malaria mosquito (WHO, 2006a), it is difficult to use larva control methods. So prevention of mosquito bite is the best method for prevention and control of malaria. Indoor residual spraying is mainly used for the purpose of controlling emergency outbreaks. Mosquito nets are commonly used to prevent mosquito bite. Other alternatives for protecting mosquito bites are using window screens, mosquito coils, using fan, applying mosquito repellents and wearing preventive clothing treated with mosquito repellent.

While other methods are deemed to be ineffective and may contribute to health risks, clothing, clothing impregnated with mosquito repellents offer the advantage of long lasting protection, requiring no re-application (Rowland et al., 1999). This kind of protective clothing is odorless and invisible, and has no direct contact of the repellency on skin, but the requirement of regularly wearing clothing and frequent washes will cause the mosquito repellent to become less effective within a short period of time. Because of weaknesses of other preventive methods and of the nature of night biting habit of malaria mosquito (Taye, Hadis, Adugna, Tilahun, & Wirtz, 2006), bed nets are the best method currently available to prevent from malaria mosquitoes and hence malaria transmission and prevention using insecticide treated bed nets is becoming a key strategy in malaria control.

Mosquito nets were started to treat with insecticides in the 1980s for malaria prevention and are known as insecticide treated nets (ITNs). ITNs are estimated to be twice as effective as untreated nets (Guyatt & Snow, 2002), and offer greater than 70% protection compared with no net (Rowland, et al., 1999). These nets are impregnated using a synthetic pyrethroid insecticide such as deltamethrin or permethrin doubling the protective power of a non-treated net by direct knock down and repellent actions against mosquitoes. ITN is also one of the most cost-effective methods of prevention (Yukich et al., 2008). In fact, ITNs, when combined with other control measures, can provide the most effective measures in controlling the malaria.

ITNs are also the part of Millennium Development Goals (MDGs) (UN, 2010). ITNs have been found to have the ability to reduce deaths in children by one fifth and incidences of malaria cases by half (for *Plasmodium falciparum* malaria) (Lengeler, 2004).

When ITN technology was introduced for the first time, the nets needed to be re-impregnated with insecticide every six months for maximum effectiveness. This process poses a significant logistical problem in rural areas. Standard ITNs have to be replaced or re-treated with recommended insecticide after six washes and, hence, are not a convenient, effective long-term solution to the problem of malaria (WHO, 2007).

With technological innovations, newer, longer lasting insecticide nets (LLIN) are starting to replace ITN's in many malaria control projects. LLIN has been proved to be cost-effective because of its low cost, reusability, and durability (WHO 2007) (Erlanger et al., 2004) (Tami et al., 2004). ITNs protect people sleeping under them and at the same time kill mosquitoes by knock down action on contact with the net. Some extent of protection is also provided to those by this method, including people sleeping without the net in the same room. However, mathematical modeling has estimated that disease transmission can be worsen after bed nets have lost their insecticidal action under certain conditions (Yakob & Yan, 2009). While the ITN users are protected by the physical and chemical barrier of the net, non-users who do not have ITNs in their sleeping room could experience an increased mosquito biting rate since the mosquitoes are driven away from the ITN users (Yakob & Yan, 2009). The modeling suggests that this could increase the malaria parasite transmission when the human population density is high or at lower human densities when mosquitoes are more adept at locating their blood meals (Yakob & Yan, 2009). This finding urges to focus further research on non-users of ITNs.

Many malaria control projects are using insecticide impregnated nets (ITNs) as a core of prevention activities. Despite the insecticide treated net promotion campaigns, some people are still not using the ITNs (Vanden Eng et al., 2010). In a study in Western Kenya, despite the educational activities and free distribution of ITNs, only fifty percent of the distributed nets are being used (Alaii, et al., 2003). Studying the determinants of bed net use is very useful and helpful for the malaria

control policy makers in determining the most effective malaria prevention and control strategies.

Although a lot of funding has been used for free distribution of ITNs for malaria control projects, the country data for ITN usage is not available because of the weakness of the database system. There are some studies on malaria among migrants along Thai-Myanmar border (Tipmontree, Fungladda, Kaewkungwal, Tempongko, & Schelp, 2009) and studies on bed net usage in other countries (Alaii, et al., 2003; Biswas, et al., 2010) which explored factors associated with non-use of bed net such as socio-economic status, knowledge and cultural beliefs related to malaria causation, prevention and treatment, and shape of the bed net, but there is no bed net usage study on internal migrants inside Myanmar including Nawnghkio Township area. Studying the determinants of bed net use is very useful and helpful for the malaria control policy makers in determining the most effective malaria prevention and control strategies.

1.1.4 Why critical medical anthropology is used?

From the previous studies, it was learnt that bed net use is mainly related to economic status of the people (Biswas, et al., 2010; Jombo et al., 2010; Onwujekwe & Nwagbo, 2002), seasonal and environmental condition, mosquito nuisance and mosquito density (Yohannes et al., 2000), and cultural beliefs on causation of malaria and gender difference (Rashed et al., 1999), . Based on these studies, malaria programmes were designed to increase the rate of ITN use, for example by emphasizing more on free distribution of ITNs/LLINs (Noor, Amin, Akhwale, & Snow, 2007).

The puzzle remains when some people are not still using the ITNs despite a lot of ITN promotion campaigns (Alaii, et al., 2003; Vanden Eng, et al., 2010). There is a gap that those studies described failed to solve. When a situation is complex, it is difficult to explain from individual perspectives. It can probably be understood by interrelation of factors from different perspectives at different levels, from individual level to micro- and intermediate social levels.

There can be affects of the health care delivery system of the area where a form of pluralistic medical system also persists just like many other societies. The

major health care system is the biomedical system supported by the government and non-governmental organizations. Other medical systems include self medication, traditional healers, quacks and spiritual healers. There can be some differences in medical systems among migrant groups and between migrants and the locals. The impacts of these medical systems will also be studied.

When the malaria intervention programmes are vertical, people have, more or less, come into contact with the ITNs or LLINs which are technologically advanced. It is also important to know how the interaction between humans and ITNs has impact on people's experience and beliefs on ITN.

The study on the interrelationships between each levels of the society in determining the use of ITNs among migrants in rural community may help the policy makers to make necessary changes in health care planning. A knowledge and understanding of the complex social and cultural believes of a particular society is important in designing community based malaria control projects aiming at preventing and controlling malaria in endemic areas.

The critical medical anthropology can better fill the gap and answer the unsolved puzzles. Because ITN usage behaviour is a complex phenomena and critical medical anthropology can make critical analysis of the detail situation from macro- down to intermediate-, micro- and individual levels based on ethnographic studies. Just like the studies done in other countries, it is hoped to discover the social and cultural factors related to ITN usage (Rashed, et al., 1999).

1.1.5 Researcher motivation

I worked in the rural area of Nawnghkio Township as a malaria project medical doctor for four years with an Italian based NGO. According to my observation, despite our vigorous efforts to promote the use of the ITNs in the community, migrant workers seemed to be excluded from the programme and were still attending the malaria clinics. I hope this study will be able to fill this gap and provide the evidence based information for the health care providers so that they can modify the project design so that migrants are able to protect and prevent themselves from being contracted with malaria.

1.2 Research question

1.2.1 General research question

What are the social determinants of the use of insecticide treated mosquito net (ITN) for malaria prevention among migrant workers in Nawnghkio Township?

1.2.2 Specific research questions

1) How do migrant workers in Nawnghkio Township give the meaning to malaria and ITN?

2) How do the health care delivery system related to malaria control programme and social relations within migration context have affected the migrant workers' belief system on malaria and ITN and has impacts on the use of ITNs?

3) How does the health care delivery system relate to malaria control programme in Nawnghkio Township for migrant workers?

4) How does social relation within migration context exist among migrant workers and local people?

1.3 Objectives

1.3.1 General objective

To explore social determinants of the use of insecticide treated mosquito net (ITN) for malaria prevention among migrant workers in Nawnghkio Township, Myanmar

1.3.2 Specific objectives

1) To explain the health care delivery system related to malaria control programme for migrant workers in Nawnghkio Township

2) To describe that the discriminated social relation within migration context exists among migrant workers and local people

3) To explain how the health care delivery system related to Malaria control programme and discriminated social relation within migration context have affected the migrant workers' belief system on Malaria and ITN and has impacts on the use of ITNs

4) To discover the belief system of migrant workers influence their decision making process on ITN usage

CHAPTER II
LITERATURE REVIEW

The initial step to find the answer of my research questions and fulfill the research objects comes with reviewing the previous literature. This chapter consists of a review on theoretical concepts, a glance on the previous studies done on determinants of insecticide treated bed net use and an explanation on conceptual framework of the study.

2.1 Theoretical concepts

2.1.1 Critical medical anthropological perspective

2.1.1.1 Anthropological theories in general

Anthropology is the systematic study of the root, the manner, and the biological, social, and cultural development of human beings (McGee & Warms, 2008). It tries to understand the insider's view of different cultural groups. There are four major branches of anthropology; (1) Physical or biological anthropology, (2) Archaeology, (3) Linguistics and (4) Cultural anthropology (Barnard, 2004). The full spectrum of theory and methods in medical anthropology has been used in anthropological research on malaria (Coreil, 2004).

2.1.1.2 Medical anthropology

It is developed from the four major fields of anthropology (William A. Haviland, 2008). It fills the culture gap between the society and other disciplines of sociology, economics and geography, as well as biomedicine, public health and other health professions.

Medical Anthropology is "the anthropological way of understanding health, disease and sickness" (Brown, 1998). It is the study of health and illness, health care systems, and biological and cultural adaptation, and believes of human beings (McElroy, 1996). Medical anthropology tries to explain the insider's view which is contextualized and is multi-factorial.

Major orientations of medical anthropology include Medical ecology, Ethnomedicine, Applied medical anthropology and Critical medical anthropology (Coreil, 2004).

2.1.1.3 Critical medical anthropology

Critical medical anthropology (CMA) is related to political economy of health and illness (Baer, Singer, & Susser, 2003a). It analyses biomedical practice and the differentials in power and authoritative knowledge of health care practioner and patient, and the effect of social inequality on the health of people.

The initial step of critical medical anthropology started in a symposium "Topias and Utopias in Health" at the 1973 Ninth International Congress for Anthropological and Ethnological Sciences, from which a volume with the same title was published (Moerman, 1977). Soheir Morsy in 1979 wrote a review essay "The Missing Link in Medical Anthropology: The Political Economy of Health". After Morsy's essay, Vincente Navarro's research on political economy of health, and articles in the International Journal of Health Services, Baer (1982) wrote a short literature review and its relevance for medical anthropologists. Starting from 1983, other medical anthropologists started CMA sessions during the anthropological meetings and several CMA journals were published.

The concept of biomedicine and a perspective on capitalism are important starting points in CMA. It focuses the health related issues in indigenous, pre-capitalist and socialist-oriented state societies. By understanding CMA, health issues can be analyzed in the context of surrounding political and economic forces—including forces of institutional, national and global scale— which influence local ecologies and human relationship, provide accumulated experiences, configure social behaviours, and develop cultural meanings. CMA represents a turning point towards political-economic approaches in general anthropology and an effort to

engage and extend the political economy of health approach (Baer, Singer, & Johnsen, 1986; Singer, Baer, & Lazarus, 1990).

CMA seeks to understand who ultimately controls biomedicine and what the implications are of such control. An analysis of the power relations affecting biomedicine addresses questions such as: (1) Who has power over the agencies of biomedicine? (2) How and in which forms is this power designated? (3) How is this power revealed in the social relations of the various groups and actors of the health care system? and (4) What are the principal contradictions of biomedicine and associated arenas of struggle and resistance that affect the character and functioning of the medical system and people's experience of it?

Study of the impact of power relations in the health services delivery needs to realize the existence of several levels in the health care systems of developed capitalist, underdeveloped capitalist, and socialist-oriented societies (Baer, Singer, & Susser, 2003b).

The macrosocial level: Critical medical anthropology recognizes that the development and expansion of a global economic system represents the most important, exceeding social event in the same historic period. Capitalism has progressively shaped and reshaped social life. As a discipline, anthropology has lagged in its attention to the nature and transforming influence of capitalism. As part of the larger effort of critical anthropology in general to correct this shortcoming, CMA attempts to root its study of health-related issues within the context of the class and imperialist relations inherent in the capitalist world system. Biomedicine must be seen in the context of the capitalist world system. Some of the particular agents of the world-system operating in the health sector include international health organizations, national bilateral aid programmes, all multinationals (especially pharmaceutical companies, medical equipment companies, polluting and exploiting industries, agribusinesses, commercial food companies, chemical fertilizers and pesticides companies, and sellers of contraceptive devices), and a medical cultural hegemony supporting these agents.

At all levels the health care systems of advanced capitalist nations reproduce the structures of class relations. The profit-making orientation caused biomedicine to evolve into a capital-intensive endeavor heavily oriented to

high technology, the massive use of drugs and medical equipments, and the concentration of services in medical complexes. The state legitimizes the corporate involvement in the health care practice and reinforces it through support for medical training and research in the reductionist framework of biomedicine. Corporate-controlled foundations simply augment the state, at both international and national levels.

Complex societies have a pattern of medical pluralism. Biomedicine enjoys a dominant status over heterodox and ethnomedical systems. This dominant status is legitimized by laws that give biomedicine a monopoly over certain medical practices and limit or prohibit the practice of other types of healing. Various heterodox medical systems, such as Ayurveda and Unani in India; natural medicine in Germany; and chiropractic and naturopathy in the United States, Canada, and Britain, may have their own professional associations, schools, hospitals, and clinics and thus replicate the organizational structure of biomedicine. Biomedicine systematically attempts to shore up its dominance by progressively subordinating an array of assumed competitors. Nevertheless, alternative practitioners proliferate and even flourish in certain areas. In most folk and popular culture, medicine is practiced and learned outside of bureaucratic settings. The important role of class and related social struggle is as a cause of medical pluralism. Helpless populations may try to stick to or bring back into use traditional ethnomedical practices as an expression of resistance to oppression or as a marker of group identity, while countercultures may initiate new medical systems for similar reasons. Similarly, the inability of biomedicine to cure the somaticized distress and sickness related to the postmodern world becomes a mighty source for medical pluralism. In such conditions, it is usual for popular health sectors, traditional folk healing systems, and alternative medical traditions to be appeared to fill the gap. Despite elements of resistance in these alternative medical systems, it is important to notice the capacity of biomedicine and its supporters in the capitalist class and the state sector to co-opt them. Nevertheless, it is important to point out that the growth of nongovernmental organizations (NGOs) has come more and more to serve as a counter-hegemonic force challenging corporate and state health policy makers. As Walt (1994: 204) observes, NGOs constitute a “sign of increased civic challenge,

which may be translated into new social movements and public protest but may also create debate within existing formal institutions" (Walt, 1994).

The intermediate level: At the intermediate level of health care systems, the hospital, which varies in size from a tertiary health center in a city to a rural hospital, has become the primary area of social relations. Members of the corporate class and the upper-middle class have the wide spread control over both "reproductive institutions" (health foundations and private and state medical teaching institutions) and "delivery institutions" (voluntary and proprietary or profit-making hospitals). The power that hospital authorities and physicians enjoy at this level is a representative power. The professional dominance of biomedicine is secured by the political and economic influence of the highest class of people which sponsors it—an influence that drives competitors out of the same area of ground, that hinders others by rectitude of the competitive advantages to be compared on the chosen occupation and that still requires others to be subordinated to the profession.

Although physicians exert a great deal of control over their work, because of their monopoly of medical skills and the congruence between their version of disease theory and capitalist ideology, they find themselves subject to bureaucratic constraints in hospitals. Some social scientists have even argued that physicians are undergoing a process of deprofessionalization or proletarianization in their status as employees of health care corporations and health maintenance organizations (HMOs) that seek to increase their profits under the guise of managed care. In addition to an increasing number of physicians employed in public agencies, hospitals, medical schools, insurance companies, and HMOs, even those in office-based practice are dependent on their hospital associations to go with their work, and increasingly face restrictions under the rules of the hospital as a social and legal existence" (Mechanic, 1976).

The existence of various kinds of other health workers means that the medical hierarchy replicates the class, racial, and gender hierarchy. The nurse as a relatively high-status subordinate traditionally was supposed to exhibit obedience toward physicians and the top administrative staffs, although the effect of the feminist activities had altered these arrangements in certain places to some extent. According to Stein (1967), early in the training the nurse learned to play the "doctor-nurse game,"

where it is needed rely on the physician for their carrier opportunity. Despite their stereotypic nurturing role, many registered nurses now serve as lower-level managers who must carry out policies made at higher levels (Stein, 1967). The ironic twist of this development is that the health workers with the lowest status and least power are those persons who come into the most continuous and intimate contact with patients in hospital settings. The medical hierarchies of advanced capitalist countries are replicated in Third World nations, though various accommodations are made to local customs and traditions.

Class struggle has become an explicit aspect of the intermediate social level. While the trend toward unionization in U.S. hospitals first occurred among its underpaid unskilled and semiskilled workers, it has also spread to technicians, nurses, and even physicians. Factors serving to mitigate demands by unionized hospital workers, however, include the shift of costs from higher wages to consumers and the emergence of a "new professional managerial class of hospital administrators" who are sometimes willing to arbitrate with unions in return for disciplined workers (Krause, 1977). Furthermore, professionalization continues to be seen by many health workers as a more viable approach for socioeconomic advancement, thus preventing them from forming an alliance with lower-status workers. In recent years, many hospitals have turned to downsizing their full-time nursing staffs by utilizing either temporary registered nurses or licensed practical nurses and nurses' aides as cheaper forms of health care providers.

The microlevel: The microlevel primarily refers to the physician-patient relationship and what Janzen (1978) calls the "therapy management group." One of the responsibilities of the physician, diagnosis, is strongly influenced by social factors outside the examining room. Similarly medical treatment, the other major task of the physician, is not determined solely by the needs of the patient. It also serves the special needs of physicians and other powerful sectors within and outside the health care system (Janzen & Arkinstall, 1978). The physician role, in fact, performs two key functions for the encompassing social system and its existing distribution of power: (1) controlling access to the special prerogatives of the sick role and (2) medicalizing social distress. In the first, the physician may limit access to the sick role by judging whether an individual may or may not be excused temporarily

from work. It must be noted, however, that his or her power in this area is far from absolute, in that most people adopt the sick role without consulting physicians. They frequently consult with lay members of the therapy management group in arriving at this decision. In the second function, according to the reductionist model of disease in which physicians assign the source of disease to pathogenic or related factors, personal stress emanating from social structural factors such as poverty, unemployment, racism, and sexism is secluded from the potentially disruptive political arena and secured within the safer medical world of individualized treatment. The ultimate function of both the gate-keeping and the medicalizing activities is social control (Zola, 1978). Research and analyses at the microlevel must begin to locate the physician-patient relationship in the broader political and economic framework (McKinlay & Arches, 1976).

The individual level: The individual level permits a reflection of the individual's response to sickness or sufferer experience. An individual's body feels the distress that its bearer is experiencing (Scheper-Hughes, Nancy, & Lock, 1987). The critical approach to the individual level commences with the acceptance that sufferer experience is constructed and reconstructed in the action area between socially constituted categories of meaning and the political-economic forces that shape the context of daily life. Realizing the strong influence of such forces, however, does not mean that individuals are passive or non-human objects but rather that they respond to the physical conditions they meet in the context of possibilities created by the social relations existed. Medical anthropology needs to generate consciousness of the ways in which sufferer experience results challenges to medical hegemony at both the individual and combined level. Because of these reasons, the study of sufferer experience and action is an important remedy to the tendency to assume that, because power is in the hands of macro level structures, the micro level is decided from above. What is missing from this understanding of the construction of daily life is an enhancement of the capacity of the micro level to influence the macro level.

Starting 1980s, the idea that human experience is embodied is argued by Sheper-Hughes and Lock (1987). Under the influence of such idea, the body has become a point of interest in the medical anthropology study. We know the world through our bodies. We know ourselves and others not as separate minds or

personalities, but as personalities within each of the bodies. Illness and disease occur within bodies and are experienced by sufferers as bodily sensations. In that body, treatment of illness and disease is focused, to some extent depending on the healing system and on modifying the body. Conceptualization of the human body is a critical issue for medical anthropology. Our bodies are not self-evident; they are not just the biology directly perceived through an objective, perspective without culture. But, they are a point of combination and embracement of biology, lived experience, culture, and social relationship.

In other words, the body is culturally and socially constructed. It does not deny the material existence and physical properties of the body as a biological system that has a reality separate from human consciousness, but can be said that: (1) we do not aware of our bodies independent of our cultural frames of understanding and valuing; (2) societies shape the human body to match cultural expectations; and (3) social relationships are transferred directly on the body in both intentional and unintentional ways.

All cultures develop an understanding of the human body. In addition to images and ideas, cultural influence on our experience of the human body includes the impact of values, that is, beliefs about good and bad, right and wrong. The differing ways people conceive and value the human body are evident not only in variations across societies but also within societies. The work of culture on bodies is not merely conceptual, it is also physical. Tattooing and body piercing are contemporary illustrations of the ways people actively engage in recreating their physical bodies to match to desired formations. These practices are often explained as a form of self-expression. Their relatively sudden and widespread appearance, especially in certain age and social groups, implies that cultural forces and not only individual likings and values are functioning. In fact, throughout history, humans have reconfigured their bodies to conform to cultural standards.

Work-site exposure to toxic substances produces another type of bodily difference between the classes. Reviewing the literature on this issue Millen (2000), for example, noted that half of the workers in factories that produce industrial chromates have been found in both Mexico and South Africa to have perforated nasal septums (Millen, Joyce, & Millen, 2000). Indeed, exposure to toxins in manufacturing,

mining, and farming is quite common among workers in developing nations, producing a wide range of disease impacts on lives and bodies. Environmental exposure to toxic substance also differentiates the bodies of upper and lower classes. Dumping of toxins is much more common in the poorer areas of poor countries than in wealthier locations, even if the substances are produced in wealthy countries and shipped for disposal to poorer ones. A wide range of industrial toxins, such as mercury and lead, are dumped into the environment of poor countries each year resulting in a host of damaging effects on the bodies of poor and working class individuals. Similarly, poor neighborhoods are much more likely than wealthy ones to be sited for garbage dumps or other waste disposal locations.

The study of the mindful body in interconnected experiential, cultural, social, and political economic contexts, with particular concern for the ways social inequality is inscribed in bodies and bodies, in turn, are transformed into consumers of self improvement commodities (or themselves become commodities for sale for the improvement of others) are key topics for critical medical anthropology. Implied in this wide range of concerns is the belief that a critical perspective provides the conceptual framework needed to analyze macro-micro connections (e.g., between individual experience, decision-making, and action and powerful social forces like global commodity and labor markets, social stratification, and transnational geo-political domination).

CMA is viewed as providing a perspective and set of concepts for analyzing macro-micro connections. At the theoretical level, some maintain that critical medical anthropology has developed two competing groups, the political economy/world system theorists and the Foucaultian poststructuralists (Morgan, 1987). The study of lived experience, embodiment, social suffering, and individual agency are all-important to the CMA approach. What is distinctive with regard to CMA's approach to the individual level is its recognition of the degree to which issues of power, inequality, oppression, exploitation, and the like create the social environments within which the individual level is actualized and intimately contributes to the social shaping of individual experience, the social construction of human bodies, and the social production of potential pathways of personal action.

CMA rejects a simple dichotomy between the "anthropology of medicine" and the "anthropology in medicine" that separates theoretical from applied objectives (Foster & Anderson, 1978). Rather, critical medical anthropologists seek to place their expertise at the disposal of labor unions, peace, environmental, ethnic community, women's health, health consumer associations and organizations, self-reliance activities, alternative health efforts, national liberation campaigns, and other bodies or initiatives targeting liberation of people from oppressive health and social circumstances. In summary, critical medical anthropologists contend to contribute to the larger effort to create a new health system that will benefit people and not favour the narrow interests of a small, restricted group of society. Its creation requires a fundamental transformation of existing economic relationships.

Because of its complex situation involving multiple factors which vary on changing social and cultural contexts and because of impact of different levels of social structure, determinants of insecticide treated bed net use research can achieve more meaningful and realistic result only if CMA perspective is used.

2.1.2 The concept of migration

Migration is the process in which people, often in groups, move from one part of the world to another for various reasons (Jennissen, 2007). The reasons for migration can be push factors of the original place forcing people to move out or pull factors of the host place attracting migrants to come and work in the new place (Kainth, 2009). Migrations can be internal (domestic) or international (transnational). In this study, domestic migrants will be focused.

The migrants live in the scape constructed from the interaction between two cultures: one from the place of origin and another from the new place (Appadurai, 1996). Appadurai's social imaginary view consists of five scapes of migratory cultural flow: the ethnoscapes (the group identity of migrants), the mediascapes (the various kinds of media providing information), the technoscapes (the technology), the financescapes (the financial/capital character) and the ideoscapes (the newly constructed ideas).

According to the concept of migration, people are forced to migrate from one place to another and develop new perceptions and beliefs depending on the

contextual changes they encounter. The established belief system will have effect on the decision of migrants on their bed net usage practice.

2.2 Previous research works on social determinants of bed net use in other countries

In a research conducted on Bioko Island, Equatorial Guinea that studied the determinants of bed net use in children under five and household bed net ownership, the author argued that bed net use is related to bed net ownership. The bed net ownership is in turn determined mainly by knowledge about malaria and rural-urban area difference. The question here is why rural people are less likely to protect their children than the urban people (Garcia-Basteiro et al., 2011).

In the study on bed net ownership, use and perceptions among women attending antenatal care clinic in Kinshasa, Democratic Republic of the Congo, it is said that cost is the main barrier to bed net use among the pregnant women and the level of education is another determining factor of bed net use (Pettifor et al., 2008).

In a research assessing bed net use and non-use after long-lasting insecticidal net distribution, it is described that insecticide treated nets (ITN) use is mainly related to availability of bed net for each of the individuals rather than household ITN ownership. The individual availability of bed net is determined by the ITN promotion campaigns. So the article highlights the weakness in the function of the ITN promotion campaigns. There are some individuals who are not using bed nets although ITN is available for them. The article failed to explain why those individuals are not using ITN (Vanden Eng et al., 2010).

In a study in rural Kenyan children, the degree of inequality in socioeconomic targeting by the three principle net delivery systems of commercial social marketing, the PSI-MCH programme and a free of charge mass distribution campaign, influence the ITN use in rural children of Kenya. The article did not explain the other possible factors that influence the bed net usage (Noor, et al, 2007).

When the social structures linked to supply chain of bed nets are functioning well, it can improve the bed net use. In the research done in Kinshasa, Democratic Republic of the Congo (DRC) , free distribution of ITNs to pregnant

women in antenatal care clinic results in improved number of pregnant women using bed nets (Pettifor et al., 2008). Structural functional perspective always views and explains the problems of the society only as malfunction of the components parts of that society in general.

In the article "Investigating starting-point bias: a survey of willingness to pay for insecticide-treated nets," in which sellers who did the transaction started by quoting high prices relative to what the buyers thought the net was worth were most likely to have more price rejections and less sales. Only some bought at the high prices. The article just explained on the basis of starting prices as determinant of decision making to buy bed net. If the starting price was low, people decided to buy and own bed nets and were more likely to use bed nets. In practical, other factors are involved in determining the bed net ownership and hence the use of it (Onwujekwe & Nwagbo, 2002). The free distribution of ITNs has been shown to be the most effective method of malaria prevention (Hoffmann, Barrett, & Just, 2009).

It is argued that lowered role and hence power of women in compared to the position of man, most of which are household heads, determines the decision to buy and use bed net. Although women want to buy bed net, it is the man household leader who makes the decision whether to buy bed net or not (Rashed et al., 1999). It can only explain the problem only when there is gender inequality. It is needed to find out the cause of the problem whether there is gender difference or not.

In the ethnographic study "Determinants of the Permethrin Impregnated Bednets (PIB) in the Republic of Benin: the role of women in the acquisition and utilization of PIBs," the factors affecting insecticide treated bed net use are income, local cultural knowledge on malaria, gender role, education standard and habit of involving in community activities. It is a very good research which helps health care professionals understand more on local people and their cultural environment which has great influence on determining their bed net use and so able those professionals to design better and more efficient disease control projects. The only weakness of this research is that it was done more than 15 years ago and there rise the question of findings fit for the present context. (Rashed et al., 1999)

According to another ethnographic study "Community reactions to the introduction of Permethrin-treated bed nets for malaria control during a randomized

controlled trial in Western Kenya," the people there believed that there are many causes of malaria and use of ITN is only partly effective in preventing malaria and together with the peoples' fear of the toxicity of the insecticide, it determines peoples' perception on ITN use as a tool to prevent malaria. (Alaii et al., 2003)

In the article "Socio-cultural factors influencing insecticide treated bed net utilization in a malaria endemic city in north-central Nigeria," the illiteracy, destitution and cultural beliefs are major determinants in that context; in which positive contributors to ITN use were higher level of education, enhanced economy, experience of marriage, and being employed in certain professions such as health worker, civil servant or teacher/lecturer; while negative contributors were ignorance, poverty and some cultural beliefs such as fear of death, net meant for cold nights, and values (Jombo et al., 2010).

The study "Determinants of bed net use in the Gambia: implications for malaria control" proved that households from the Mandinka ethnic group of the three main ethnic groups are more likely to own a bed net compared to other groups. Expenditures on aerosol sprayers, mosquito coils, indoor residual spraying, use of smoke, and other prevention strategies such as drinking herbal medicines and cleaning the outside environment were negatively associated with the bed net ownership. The lack of ability to explain the reason is one weakness of this study. Another weakness is that it only finds out the factors affecting the bed net ownership and not the bed net use which are different since one may not use it although it owns bed net (WISEMAN, SCOTT, MCELROY, CONTEH, & STEVENS, 2007).

The critical medical anthropology can better fill the gap and answer the unsolved puzzles. Because ITN usage behaviour is a complex phenomena and critical medical anthropology can make critical analysis of the detail situation from macro- down to intermediate-, micro- and individual levels based on ethnographic studies. Just like the studies done in other countries, it is hoped to discover the social and cultural factors related to ITN usage (Rashed et al., 1999).

There can be affects of the health care delivery system of the area where a form of pluralistic medical system also persists just like many other societies. The major health care system is the biomedical system supported by the government and non-governmental organizations. Other medical systems include self medication,

traditional healers, quacks and spiritual healers. There can be some differences in medical systems among migrant groups and between migrants and the locals. The impacts of these medical systems will also be studied.

When the malaria intervention programmes are vertical, people have, more or less, come into contact with the ITNs or LLINs which are technologically advanced. It is also important to know how the interaction between humans and ITNs has impact on people's experience and beliefs on ITN.

These problems could be explained from critical medial anthropology approach. The research based on critical medial anthropology perspective can help the policy makers to make necessary changes in health care planning. A knowledge and understanding of the complex social and cultural believes of a particular society is important in designing community based malaria control projects aiming at preventing and controlling malaria in endemic areas.

2.3 Conceptual framework on social determinants of insecticide treated bed net use among migrant workers using critical medical anthropology perspective

In this study, critical medical anthropology will be applied to explore how social and cultural factors are operating at different level and affect the bed net usage of migrant workers. Because of the limitation of the study period, individual level will be more focused in the context of other levels, rather than emphasizing on all the levels of CMA.

Factors influencing the decision making process, and hence the bed net usage behavior, can be coming from various levels in the framework of CMA within the context of migration. The macro-level determinants can be state policy, medical systems and the capitalist ITN market systems. State governments develop the policy which is in favor of western medical system compared to other medical systems. It also supports ITN market. Profit oriented ITN market system will have influence on medical system. Intermediate level determinants may be health care policy, intervention and implementation. At the micro-social level, power relations with

health care providers, interactions with family members, discriminated social relationship with local villagers and sharing of cultural experiences with other migrants, will influence the cultural belief of migrants on illness, health, malaria and ITN.

In the context of influence of upper levels, individual life experiences and events will have influence on perceptions, beliefs, cultural and social meanings, decisions and ITN usage behavior. Combination of the actions at different levels will finally influence the migrant workers' decision for bed net usage.

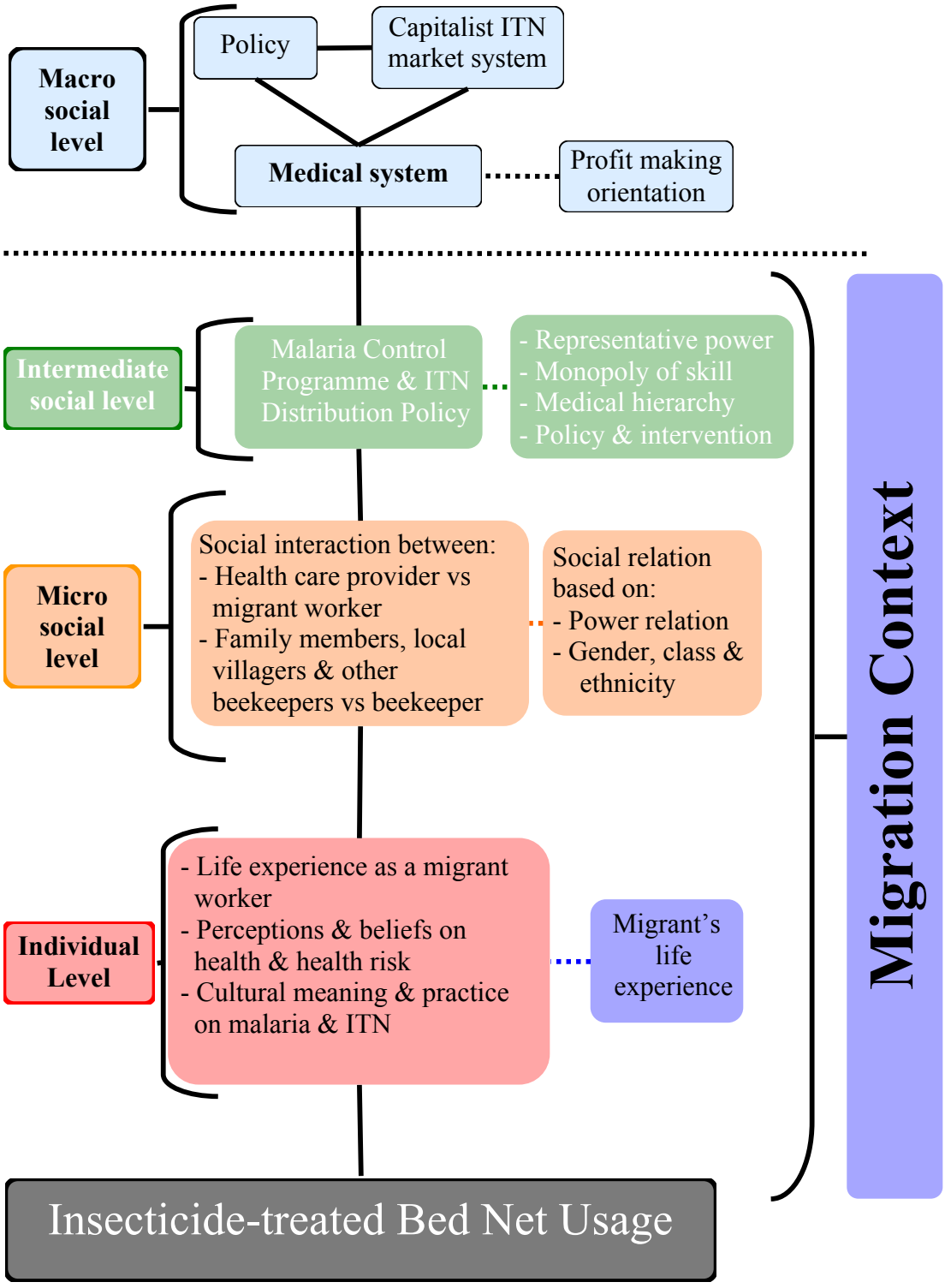

Figure 2.1 Conceptual framework on social determinants of bed net use among migrant workers using critical medical anthropology perspective

CHAPTER III
RESEARCH METHODOLOGY

3.1 Research design

The study aims to explore which of the socially and culturally constructed forces influence people on their bed net usage behavior related to malaria prevention. It is a descriptive and explanatory study.

The qualitative research design with ethnographic methodology included field observation, focus group discussions and in-depth interviews. It was a community based study using a critical medical anthropology perspective in order to understand social and cultural determinants of using ITNs among migrants in Nawnghkio Township, Myanmar.

The qualitative research method is the best and the most appropriate approach to go deep into people's culture, lifestyles, value systems, belief systems, attitudes and behaviours (Ereaut, 2011). The ethnographic methodology investigates the behavior of individuals inside specific social contexts, including behavior that is configured and embarrassed by these contexts, and people's perception, understanding, interpretation and response of their experiences (Wilson & Chaddha, 2009).

For the purpose of getting the insight of migrants in their social and cultural context, an ethnographic study was done with the intensive study of the migrants, spending time with them and sharing day-to-day lives of people there. Unstructured approach in gathering the data is one of the characteristics of ethnographic study (Rosenberga, 2001). When coupled to the analysis, it allows the researcher to discover the key features. So there was no leading question during the in-depth interviews and focus group discussions.

3.2 Site selection

The study area consists of villages, camps of migrant bee keepers and their working places (bee yards). The study site selection was made based on malaria endemicity, accessibility and location of beekeepers' camps.

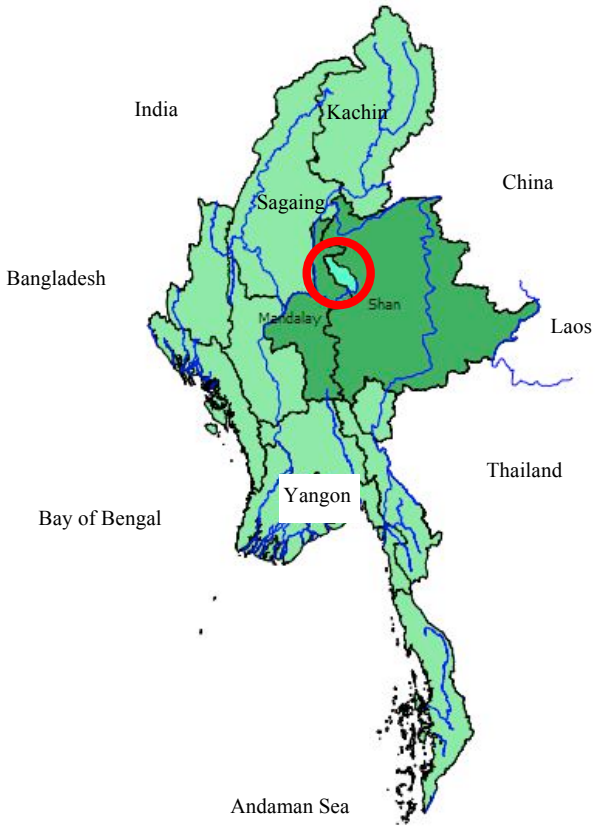

Figure 3.1 Location of Nawnghkio Township (in red circle) in Shan State, Myanmar Map produced based on (MIMU, 2007)

When I planned to study on migrants in Nawnghkio Township, I did not mention in my proposal which migrant groups to focus although I already had in my mind to focus on the migrant bee keepers in whom malaria is common. I was worried that the migrant bee keepers might not be there during my study period as they are moving from one place to another throughout the year and I did not know their movement path. So since I was still in Thailand and about to go back to Myanmar for data collection, I tried to contact one of my friends in the area. I explained him about my study and requested him to send the information to me so that I can know if the

beekeepers arrive in the area. Soon after my arrival in Myanmar after first week of July, I got the message from my friend that the bee keepers would be arriving soon. So I decided to keep focusing on the beekeepers and planned my trip to Shan State. I took a bus to Mandalay. From Mandalay, I had to take a taxi to Pyin Oo Lwin which is situated near the border of Mandalay-Shan State border, 42 miles away from Mandalay. From Pyin Oo Lwin, I travelled to Bant Bwe Village in Nawnghkio Township by another car for 18 miles. I went to my friend in Bant Bwe village and stayed there waiting for the arrival of bee keepers. I felt less worried for it was sure that the beekeepers are arriving soon. During that time, I was gathering information on migrant bee keepers with the help of my friend, U Sai Thaung Tin, whose name is that of ethnic Shan. He can speak both Shan and Myanmar languages fluently so it was very convenient for me. He works as a mechanic and repairs various kinds of farming machines. His wife is a Shan lady works as a seller at their residence-cum-shop of spare parts for farming machines. Because of the nature of their work, they have many friends in the area and it made me comfortable and relaxed.

After waiting for one week, I got the information of beekeepers starting moving into the area, carrying their bee hive boxes (Pyarr Pone) by trucks.

The study was done in the community in the central area of Nawnghkio Township, located within Northern Shan State of Myanmar. The land is average 2750 feet above the sea level and is very fertile with many small to medium sized rivers flowing across the area. The reddish coloured land is used to grow various kinds of crops and hence the agriculture is the major economy of the people staying there. It was rainy season and the rain came almost every day making it difficult to travel along the unpaved roads off the highway. The local people might be happy since that kind of rain is beneficial for their crops. The temperature was between 32° and 27° Celsius and it was neither too cold nor too hot for me and I felt comfortable in that weather. I had to use the motorbike most of the time to travel from one place to another and sometimes I was wet in the rain. Thanks to my friend who also rented me a nice motorbike. It was a difficult task and was challenging to ride motorbike on slippery and muddy roads, sometimes in the rain.

People in the area mainly belong to Shan and Dhanu ethnic groups but they can communicate with Myanmar language fluently. People stay in many villages,

small to large, which are situated one to three miles apart in the central valley of Nawnghkio Township. Bant Bwe is one of the large villages of the area. There are various kinds and groups of migrants who moved into the area for various reasons, based on rich resources of fertile land, minerals and evergreen forests.

Malaria is the top priority disease of the township health department. Malaria projects implemented by the non-governmental organizations had been working in the area since 2002.

Migrants including bee keepers, agriculture farm workers and prisoners in the convicts' camps coming in and out of the area are the reservoirs and pocket areas of malaria infection preventing the efforts to stabilize the malaria situation.

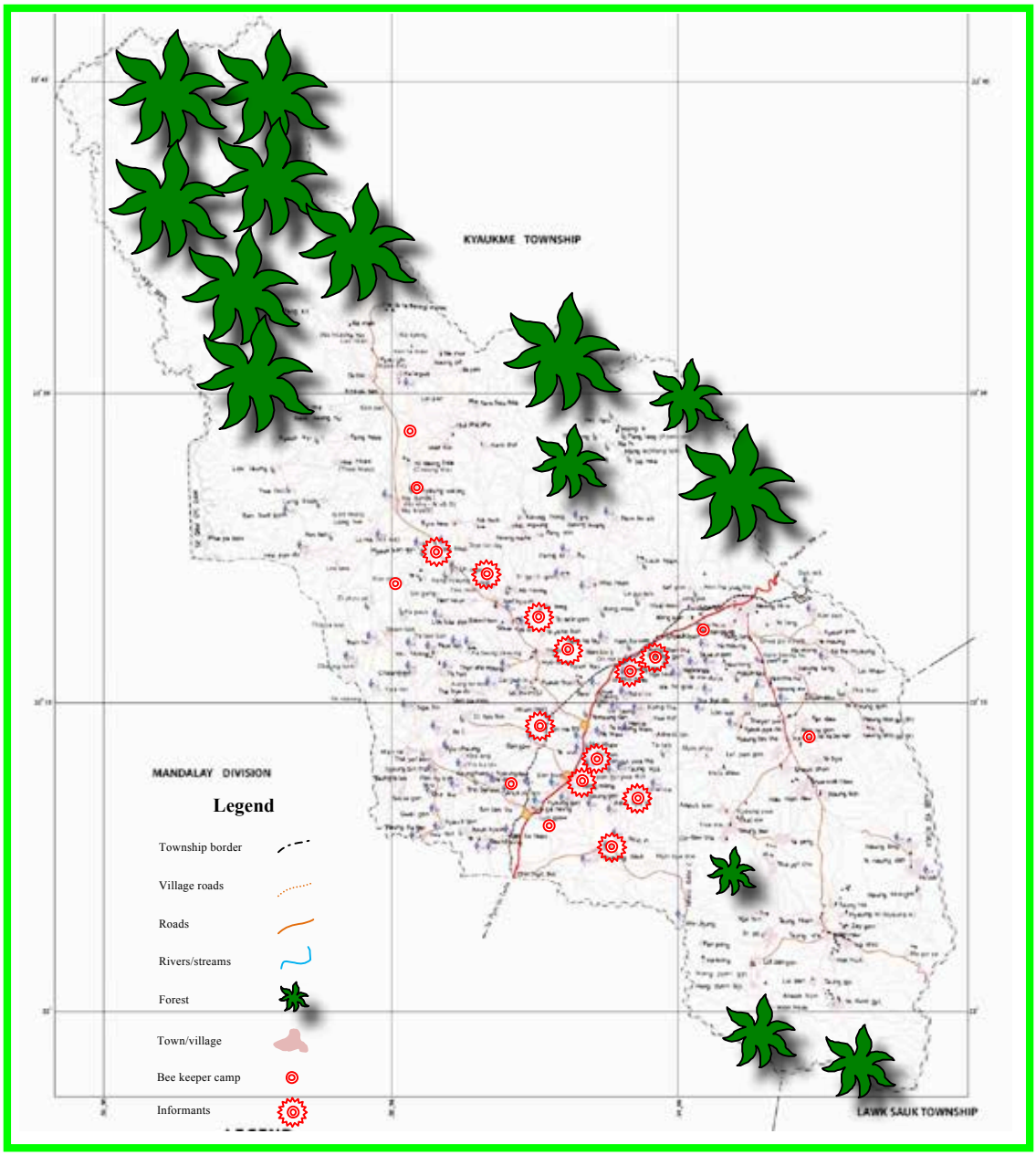

Figure 3.2 Area map of Nawnghkio Township (Aung, 2010)

3.3 Sampling methods of informants

The informants of this study are migrant mobile beekeepers living and working in Nawnghkio Township. Purposively selected informants were used to get the rich cases of information.

My friend from Bant Bwe introduced me to a bee keeper, Ko Chit, who became my key contact person among the migrants as well as an informant. Ko Chit brought me to camps of bee keepers and introduced me as a student researcher to them. After first introduction, I tried to become familiar with them by making frequent visits to their camps. I also followed their working places, bee yards. After my attempts to familiarize with them, I learnt that to be a good listener is an important quality of a researcher. Once I got my identity as a student researcher, most of them liked to explain the nature of their apiculture business, the bee keeping, and honey and bee products industry. I had to listen to them patiently and had to give my time to follow along their work places which are the places where they keep their bees and are close to agriculture farms of local villagers. Once after familiarized, I selected some of them which are good informants and which meet the following criteria.

3.3.1 Inclusion criteria

1) Migrant beekeepers, either temporary or permanent, staying in Nawnghkio Township: Among the different migrant groups working in different kinds of works, beekeepers were selected depending on their relative malaria incidence.

2) Both male and female of age older than 18 years: Upper age limit was not defined since some of the migrant workers continued to work for their survival until old age.

3) Able to communicate so that can explain the insights and beliefs related to migration and malaria

4) Those were not using ITN at the time of study

In the above criteria a “migrant beekeeper” refers to a person who moves from one place to another, national or trans-national, either seasonal or annual, either temporary of permanent, for the purpose of doing beekeeping business.

Sample sizes were not fixed prior to data collection. Sample sizes were determined on the ground of theoretical saturation, the point at which no more information on insights into research questions can be collected (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Twenty five migrant beekeepers were interviewed.

Other informants (key informants) were also recruited in order to get the information related to the context migrants are experiencing, to know the perception of migrants related to their physical, biological, social and cultural milieu. The informants included:

1. Local villagers: (7) were selected

2. Health care providers which can be any of village health workers (VHW), midwifes, and NGO workers of various ranks: (6) persons from the village and (3) medical doctors who worked for the INGO project were selected

3.4 Research method

3.4.1 In-depth interviews

The purpose of the in-depth interview is to explore the insider's view on the issue in a given situation. In-depth interview, together with focus group discussion and participant observation, is one of the methods for data and methodological triangulation. Introduction is important and it aimed to become familiar with the informants so that the conversations that follow were livelier, informal and friendly creating a relaxing and free atmosphere for them so that they expressed their insights more deeply. Being worked in the area for four years, being familiarity with many of the local villagers, health care providers and some of the migrants in the area is one of my strengths in conducting this research. For the conversation to become lively, I interviewed without looking at the guidelines paper at the time of interviewing. Instead, the guidelines were kept in mind. A semi-structured approach was used in the form of a guided and one-way conversation in which the informants were encouraged to express and talk freely. Repeated follow-up meetings with the same informant were done to build stronger trust, to get deep understanding of underlying social and cultural meanings, to explore more on beliefs on malaria, and bed net and ITN usage and to make sure that the information in the conversations was consistent to each other.

The guide lines for in-depth interview are described in the appendices.

3.4.2 Focus group discussions (FGD)

Although I proposed to conduct two FGD, each with 6 to 8 participants, I organized 4 FGDs to get homogenous involvement of the participants for each of the FGDs. The groups are one group with 6 migrant beekeepers, another group with 7 local villagers, another with 6 grass root level health care providers and one with 3 medical doctors of the finished malaria project implemented by a non-profit organization. The purpose of FGD was to get a general idea of the insights related to the original research questions and guidelines, to check the validity of the data from the other resources and the other methods, to support the information obtained from in-depth interviews and to know more on the context, belief models, religious or spiritual beliefs and diversity of cultural beliefs. Since the different ideas and potential to discriminate migrants by local villagers was expected, dividing into various groups can avoid limitations and constraints during the discussion. The first FGD of migrant beekeeper informants will target to identify the common ground and subjective interpretations and meanings with regard to malaria and bed net usage. Those who meet the inclusion criteria were selected to participate in FGD. General information of informants related to migrants' way of life, context of migrants, living conditions, life experiences and perceptions were discussed. Depending on the findings during the FGD, follow-up in-depth interviews were targeted on those who showed their potential to be key informants. Second, third and fourth FGDs consisting of non-migrants and/or health care providers were organized to get contextual ideas and information related to interrelationship between migrants and people in their surroundings.

Venues for the FGDs were determined depending on the preference of the participants aiming to provide a relaxing, natural environment where they can freely speak each other without any constraint. For each FGD, a seating chart was prepared and code numbers were given to the respondents. The names and seat numbers were recorded in the field notes. Jotted notes were noted down for the conversation and at the same time audio recording was also taken so that recorded conversation can be checked for consistency and validity.

The guide lines for FGDs are described in the appendices.

3.4.3 Observations

The process of observation covered talking to the non-migrant locals and health care providers, and visiting migrants and accompanying them to observe their daily life in the context of residential and working areas. The purpose of the observation was for the data and methodological triangulation which is used for the validity of the data.

The guide lines for observations are described in the appendices.

3.5 Research instruments

These will include:

1) Interview guidelines,

2) FGD guidelines,

3) Guidelines for observation,

4) Paper and pen for note taking,

5) A voice recorder,

6) A digital camera (in reality the camera could not be carried most of the time because of the rain) and

7) A notebook computer (although it could not use it because of the charging problem in the village with difficult electricity).

Guideline for in-depth interviews and FGD were based on research questions and conceptual framework and were translated into Myanmar language. The guideline questions were pre-tested using sample subjects and were slightly modified during the field trip accordingly. It was needed to jot down the interview and FGD conversations. The voice recorder was very helpful to countercheck the jotted notes especially while they are expended. The digital camera was used sometimes during the process of data collection wherever it is feasible especially along with observations. Expended field notes were translated into English entered into the computer later and were coded, analyzed and interpreted.

Although I proposed to train a note taker locally to assist the researcher during the FGDs, I took the jotted notes myself because of the difficulty to find

someone to help me as a note taker and I found it was convenient for me to jot down myself.

3.6 Study period

The study period is from June 2012 to March 2013. Period of data collection was from July to November and that for thesis writing and reporting was from December to March. The rainy season of the study area is from June to October. So most of the process of data collection was done in the rainy season when malaria incidence is at its peak. The process of data collection started in July 2012 during which the study area and people were familiarized, informants were chosen and rapport was constructed between the researcher and the informants. The first two focus group discussions were organized in August and other focus group discussion were organized in September. In-depth interviewing process started in August and continued towards the end of November. Participant observation was done between August and November. Analysis, consistency checking and interpretation of the collected data was done throughout the process of data collection and continued until December. Interpretation of the data and report writing spanned a period between January and February.

3.7 Data processing and analysis

The data processing and analysis was done along with data collection. After each and every interview and discussion, the jotted filed notes were immediately expanded, the transcripts were translated to English, coded, sorted, organized, analyzed, interpreted and checked for validity, consistency and missing data and feedback actions was taken by modifying the interview and/or FGD guidelines when necessary.

Content analysis method was used and it involved summarizing and classifying the contents in a thematic framework. Data was classified and arranged in groups, such as themes, ideas, and concepts. Each group consisted of many words from conversations. Word phrases and other units of text which are presumed to have

similar meanings were classified in the same category. A coding system was used during the analysis.

3.8 Trustworthiness of the data

Building trust with the informants was time consuming. People don't like to speak openly to strangers. So I have spent a lot of time to make friends with the informants. I have to make repeated visits. I have to sit down and chat with them. I had to follow their work places taking risk of being attacked by bees. I have to eat together with them. I tasted their honey, pollen and royal jelly. I tried to receive treatment using bee poison for joint pain. I gave my time to listen to their music. I spent time to site near their poker game place. It needed to show the honesty, interest in their work, friendliness, understanding and it was important to prove that there was no danger from my visits.

After making friendship, it was time to start conversations. I explained the nature of my study and thesis. Then I took the informed consent and start making interviews. For some of the questions, I have to repeat at another time to get the information.

Triangulation has been proven as an effective tool to enhance research outcomes credibility. The triangulation method depends upon the utilization of different measurement tools to filter the bias within the collected data and establish convergent results (Ghrayeb, Damodaran, & Vohra, 2011).

3.8.1 Data and methodological triangulation

Realities can be multiple and diverse. To acquire valid and reliable realities, multiple methods of searching or collecting data must be used. If it is needed to use triangulation in the constructivism paradigm, then the use of more than one researchers, techniques and data triangulations to record the building of reality is appropriate (Johnson, 1997). Using alternative methods, such as, observation, interviews and recordings will lead to more compelling, consistent and diverse rendition of realities. It is possible that triangulation includes different various methods of data collection and data analysis, but it does not means to use a fixed

method for all the studies. The methods selected for triangulation to make sure of the validity and reliability of a research depend on the concept of that study (Golafshani, 2003). So data triangulation will be done in this research using different sources coming from different informants, from the repeated interviews of the same informant, and FGDs, and methodological triangulation will be done using different methods of data collection. For this study observation, in-depth interviews and focus group discussions will be used together.

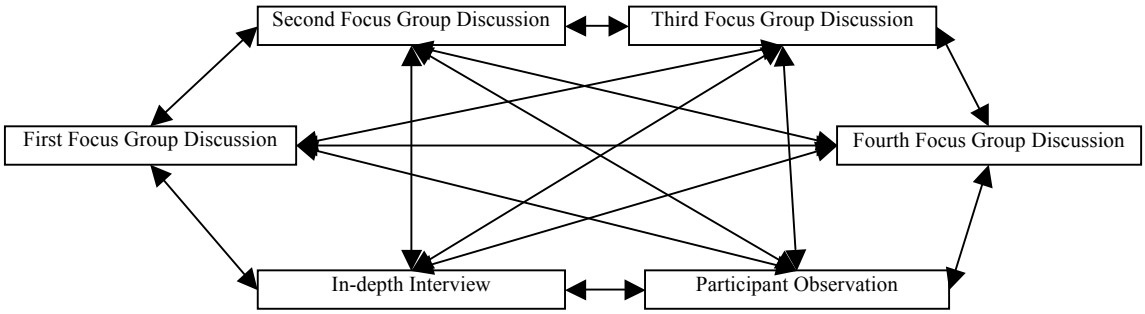

Figure 3.3 Triangulation of data sources

3.9 Ethical consideration

Ethical issues are important in social science research (SRA, 2003).

3.9.1 Informed consent

Awareness of participants' rights is the respect for them (Orb, Eisenhauer, & Wynaden, 2001). These rights include the right to be sufficiently informed about the study, the right to make free decision whether or not to participate in the study, and the right to withdraw at any time for any reason. Informed consents were taken from the participants prior to the study and all the participants have their rights to accept or refuse to participation.

Once familiarized, the informants were explained of the research and interview process verbally. Then they are given the information sheet which was already translated into Myanmar language. The information sheet provided the participants with necessary information related to the nature and objective of the

research, the process of procedures, how the information collected will be managed, the role and activities of participants, their rights to make voluntary choice whether to participate in the study or not, the right to withdraw from the study any time, the right to make their own decision whether to describe their real name or pseudonyms in the research report and the right whether they wish to sign in the consent form or give the oral consent, making sure that they understand the information. The informed consent form included the date of consent and the fact that they willingly participate in the study with a place to put the signature. Both the information sheet and the consent form were translated into Myanmar language because of the common use of the language in the study area. There was no informant with physical disability and all of them are able to communicate independently so third party individual was not needed for the consent and for the interview processes. Five of the informants just gave oral consent.

3.9.2 Confidentiality

Wellbeing of the participants and preventing harm is important in conducting qualitative research. Since some of the information for this study might be related to politics and policy making issues there can be potential consequences of revealing informants' identities. These were be prevented by doing in-dept interviews in private places and using pseudonyms in the report. Quotations or other data from the informants, although anonymous, could reveal their identity (Orb, et al., 2001). So the informants of this study were asked for the approval on the use of quotations in publications. Three medical doctors requested to hide their personal identity and also requested not to mention the name of the INGO.

3.9.3 Beneficence

It was hoped that at the end of the data collection period, people in the study area in contact with the researcher will acquire a better knowledge of malaria and its control methods. If the research findings and evidence are strong enough, there is the chance to share the data with the health policy makers and health care providers so that the information can be used to make improvements of the health care system, future malaria control projects and ITN promotion campaigns. Improved policy and

project designs especially of the ITN campaigns are also expected depending on the findings of this study. Another possible benefit for the bee keepers is that they requested me to search information related to honey and bee product market in Thailand and if I can find useful information for them, I will let them know so that they can export their products to Thailand.

3.9.4 Reciprocity

While doing ethnographic research, the conduct of the researcher is important. There will be a two-way relationship between the researcher and the study community. The researcher kept in mind to treat the persons in contact during the study equally as he would like them to treat him. There was a mutual respect on the beliefs, traditions, culture and rights of the persons involved. While I was asking them the questions, they also asked me on my student life in Thailand. So I shared my experiences in Thailand. They also wanted to know the honey and bee products market in Thailand. They requested me to look for the possibility of marketing their products in Thailand.

3.9.5 Researcher identity

Since I worked in the area as a malaria project medical doctor for four years, the people there know me very well. Orb (2001) also described that conducting qualitative research in a situation where the researcher works or is already known can raise issues and ethical considerations. For this study, I can expect to get better results because of the situation and context there which is already familiar and the possibility of getting informants who already trusted me. On the other hand, I was also worried that it is likely for the known researcher to get less information. Informants may feel being forced to participate in the study and the information may be limited. By conducting research in a familiar setting, I had to spend more time and effort establishing a new identity as a researcher and a study student from the past identity as a medical doctor from malaria project.

I explained the purpose of my visit as a student and researcher to my friend from the village. I requested him not to mention my identity as a medical doctor but to mention just as a student and researcher. Fortunately, no one among the migrant

beekeepers recognized me as a medical doctor and it made me easier to conduct my research as a student and a researcher. I also stayed and worked together with them and spent my time among the migrant bee keepers. This resulted in more subjective observations. To avoid the drawbacks, careful selections of the participants were made so that they are not forced to be informants and to make sure that there is no bias based information during the process of data validation.

CHAPTER IV
RESEARCH FINDINGS

In this chapter, the research findings are described. The first three sessions of this chapter explain the background setting so to better understand the situation. The later chapters focus on the findings related to the social determinants of ITN usage among the migrant beekeepers for the purpose of malaria prevention. These include context of research setting, background information of the respondents, life of beekeepers, social relation within migration, malaria experience and belief system, malaria project, health care systems related to ITN and beekeepers and social determinants of ITN usage.

4.1 Context of research setting

4.1.1 Nawnghkio Township, Myanmar

It was a long way when I went to the study area since Myanmar is a country with different geographical terrains. Except in the south where there is the sea, the country is surrounded by mountain ranges in the periphery (The Ministry of Foreign Affairs, 2013b). Most of the country's ethnic minority people (The Ministry of Foreign Affairs, 2013c) are staying in those, resource rich mountainous peripheral areas including Shan State.

Once I arrived in Yangon, I spent a week with the passport office for some travel documents. Then I started my trip to Shan State which is situated in the east of the country, on the Shan plateau, where it forms contiguous frontier with China in the north and north-east, Laos in the east and Thailand in the south and south-east and over 30 ethnic groups live in 55 townships. It has 3 typical seasons as other parts of Myanmar (The Ministry of Foreign Affairs, 2013a).

I went from Yangon to Mandalay City in central Myanmar. I took a night bus for 400 mile distance and it was comfortable because of a good bus and a new expressway. There was continuous rain throughout the road. From Mandalay City I took a taxi to a beautiful town called Pyin Oo Lwin 42 miles to the north-east of Mandalay. Mandalay is located in the low land whereas Pyin Oo Lwin is the start of Shan Plateau and is located on high hills some 3510 feet above the sea level. From Phin Oo Lwin, I made a local phone call to my friend, U Sai Thaung Tin, who was living in Bant Bwe Village in Nawnghkio Township. The next day, my friend arrived in Pyin Oo Lwin to fetch me. I went to Nawnghkio Township together with my friend. My friend drove his car on a high way road, connecting Mandalay City and China, which is crossing in the middle of the Nawnghkio Township from west to east. As we drove, many small villagers were seen along the road alternating with agriculture farms, gardens and forests. There are 250 villages in Nawnghkio Township. The smallest village of Ge Long has 43 people and the biggest village of Bant Bwe has 3,317 people staying there. (NTAO, 2010) The administrative town, Nawnghkio is situated in the east of the township, 74 miles from Mandalay City. Many of the villages are situated far away from the administrative offices of Nawnghkio.

After driving for an hour, we were in Bant Bwe Village of Nawnghkio Township which is situated half way between Pyin Oo Lwin and the town of Nawnghkio. I stayed with my friend's family while waiting for the arrival of beekeepers. The study area called Nawnghkio Township is situated in the north west of Shan State in Kyaukme District, where it forms boundary with Mandalay Region. The township spans an area of 1265.6 sq miles (NTAO, 2010). Being part of the Shan Plateau, mountains make half of the township's area. The average altitude is 2750 feet above the sea level ranging from 600 feet places near the Dutthawady River to 4,300 feet mountains in the south (NTAO, 2010). Low land areas of the township are notorious malaria endemic places. Many small and medium sized rivers are flowing across the central valley plane from the north-west to the south. Most of the streams and rivers coming from the north finally confluent together to flow into the Dotthawady River, which forms the boundary of the township in the south. In the north, in the east and in the south, the land is covered by forests. Central valley is fertile and people grow crops all the year round using water from the streams and river

for irrigation of their farms. There are 154,861 acres (18.89%) of agriculture land area, 146003 acres (17.81 %) of government protected forest covered area and 491686 acres (59.96 %) of unprotected forest covered area, with remaining area of wild and potential agricultural land. While the agriculture lands attract many business people and migrant workers into the area, the forest covered land and the abundant water resources provide breeding ground for various species of *Anopheles* mosquito making the area malaria endemic and putting the migrants at a relatively higher risk. The weather is hot and humid except in the cold season. This kind of weather is suitable for agriculture and breeding of various kinds of animals.

My informants, beekeepers, were still in other places and they were moving to Nawnghkio Township that month. While waiting for their arrival, I visited some of the villages near Bant Bwe. The villages were found to be more crowded in the area around Bant Bwe since most of the agriculture farms are situated around that area. Many villages are found close to each other among the agriculture fields. The markets were seen crowded with many people, most of them were found to be from Shan and Dhanu ethnic groups. Total population of the township is 129,853 (NTHD, 2012). Shan and Dhanu are the major ethnic groups which collectively forms over 80 % of township's population (NTAO, 2010). Other ethnic groups are Bamar (Burman), Gurkha, Kachin, Lahu, Chinese, Chin, Kayin, Rakhine, Kokant, Mon, Kayah, Palaung, Lwela, etc.

My friend, U Sai Thaung Tin, is a Shan and his family maintains Shan traditional style of living. Local villagers stay in their own villages in their traditional style of living. The major language is Myanmar. Shan, Dhanu and Gurkha villagers use their own language in their villages while they use Myanmar as a common language especially for trading. Most of the families are the extended type. The eldest person is usually the head of the family and elderly people in the villages have the highest authoritative power next to monks and the educated people have the third highest power. Rice is the staple food just like other parts of Myanmar. Wedding between man and woman is usually celebrated in the traditional style. Large villages (i.e., Thonze, Sumse, Bant Bwe, Thayetkon) have traditional "Every-fifth-day markets" or "Ngar-yet-zay" where the market opens and works on every fifth day. For example, if the market opens today, then it is closed for another four days. The market

opens again after the fourth closing day. So it is called “Every-fifth-day market”. For local people, those markets “Ngar-yet-zay” are the main places to trade.

I also visited Buddhist monasteries and met Buddhist monks to study the local culture. Buddhism is the main religion as in other parts of Myanmar (The Ministry of Foreign Affairs, 2013d). There are 152 pagodas, 117 monasteries and 7 Buddhist nuns’ monasteries, and there are over 1,900 Buddhist monks and nearly 200 Buddhist nuns. Other religions are Christian, Hindu and Muslim (NTAO, 2010). There are 10 churches, 4 mosques and 33 Hindu temples. Most of the houses have Buddha shrines attached to or inside the main building of the house. Local gods’ shrines can be found in almost every village. Hinduism is common in Gurkha villages and Christianity is the main religion in Kachin and Lahu villages which are the minority. The villages celebrate traditional Buddhist religious festivals. Most of the religious festivals celebrate in the dry season, i.e. October to April. There are some Gurkha villages which celebrate Hindu festivals of Nepal origin and few Kachin villages which celebrate in Christian way.

“Every year, we celebrate ‘War-so-U’ (start of the Buddhist lent period) festival, ‘Thadingyut Pwe’ (lighting festival in the Full moon day of the Myanmar month of Thadingyut, usually in October), ‘Ka-htein Aung Pwe’ (ceremony for the success of Kathina robe donation, usually celebrate between November and January), ‘Thonze Dabaung Pwe’ (Pagoda festival held in the month of March in Thonze Village, famous in Shan State) and ‘Thingyan’ (Water festival).” (Daw Nan New, villager and shop keeper)

Figure 4.1 Religious ceremony in Ahtet Kyu Inn Village

Monks not only teach religion to the villagers but also lead the villagers in every aspect. I saw monastic education primary schools in some of the villages. Apart from monastic education schools, almost every village has a government school (Sar-

thin-kyaung or Kyaung). There are 6 high schools, 7 middle schools and 154 primary schools in the whole township (NTAO, 2010). School going age starts from 5 years as in other parts of Myanmar. Some of the villages have pre-schools which accept children as young as 3 years. In the past parents liked to stop the education of their children when their children are 10 years old. It is time for their children to help in household works and farms. Most of the village children start going to school at the age of 5 and in the past most of them stop studying after the age of 10, i.e., at the completion of primary education when the child can read and write well. It is especially true for girls for whom parents assume that ability to write and read is enough and it is not necessary for women to get higher education. But today most of the parents encourage their children to study more and almost every village has young graduated individuals, both male and female.

As a profession, my friend U Sai Thaung Tin repairs agriculture related machines such as tractors while his wife Ma Nan New opens a machine spare parts shop at home. His son works as a farmer and grows sugar cane and corns. Most of the villagers are farmers. Men and women usually work together. Agriculture and agriculture-based industry is the major economy of the township. Forty nine percent of township's population is working in agriculture farms. People grow corn, rice, sugarcane, tea, coffee, potato, peanut, sesame, sunflower, various kinds of beans, wheat, damson, vegetables, seasonal flowers, cotton, etc (NTAO, 2010). In the past people use buffalos for farming purpose. At the time of survey, many farmers are starting to use machines in their farms. The flowers from the crops of agriculture farms are attracting the beekeepers.

I also saw one big sugar factory about 7 miles away from Bant Bwe Village and many smaller sugar factories that produce sugar using sugarcane produced by the sugar plantation farms. Another big sugar factory (which is supposed to become the biggest factory in the township) is under construction. I saw many brokers staying in villages along the highway road buying local crops for export companies. Other economies include timber production from the forests, lime production using naturally occurring lime stone as raw material and wood from the forest as fire, coal production from wood, apiculture (bee keeping) industry, cement production, mining and selling in own house-shops. Traders and brokers form 6 % of township's population, another

6 % are manual labourers, 5 % are workers, 4 % are working in animal farms, 1 % are industrial workers, another 1 % are government staffs and 4 % are working in other kinds of works. Remaining population is dependent (NTAO, 2010). Average income of a person in the township is 40,000 kyats per month (NTAO, 2010).

When I visited Shan villages, the people I met were mostly elderly people and children because many of the younger generations were going to Thailand, to work there as migrant workers. The first reason for going to Thailand is that they can earn more wages when they work in Thailand. The second reason is that Shan language speakers can learn the Thai language easily since there are many similarities between the two languages. While the young generation from the township was migrating to Thailand, the growing business in the area attracted people from other parts of the country to migrate into the township as migrant workers because the salary is a little bit higher in Nawnghkio Township compared to those places.

There were many people migrated from other parts of Myanmar to stay and work in different businesses in Nawnghkio Township. Migrant groups in the township consists of agriculture farm workers, beekeepers, lime production workers, coal production workers, road construction workers, prisoners, government staffs including teachers, timber production workers, factory workers, sellers and NGO staffs etc.

4.1.2 Health care system and malaria situation

I also visited the rural health centres in some of the villages and the township hospital at Nawnghkio. The government health care system in the township is managed by the Township Health Department. There are three hospitals in the township: one township hospital (25 bedded) and 2 station hospitals (16 bedded each). The government health centers include one township health department, maternal and child welfare association, school health team, 2 station health centres, 4 rural health centers and 19 rural health sub-centers. There is a VBDC (vector borne diseases control) team which includes a malaria supervisor (MS) and a permanent spray man (PS) (NTHD, 2012).

Malaria is leading the top priority health problems listed by the Township Health Department, and is followed by diarrhoeal diseases, acute respiratory track

infection (ARI), tuberculosis (TB), dysentery and viral hepatitis (VH) (NTHD, 2012) while road traffic accidents are becoming more common, and alcoholism and opium addiction is a problem among young individuals. Top killing diseases in 2012 listed by THD are ARI, TB, malaria, diarrhoeal diseases and viral hepatitis. Previously, the malaria is the top killing disease. But in the last year (2012), the mortality list shows malaria in 3rd place next to ARI and TB (NTHD, 2012). Malaria is endemic in the area. Abundant water resources formed by many rivers flowing across the forests of the township favours the breeding of *Anopheles* mosquitoes which can carry the malaria parasite. Migrants, prisoners and the travelers are high risk groups to be infected with malaria.

Malaria situation in recent years apparently improved as a result of community-based malaria prevention and control projects.

> *"Now we don't have any villager who got 'Hnget-phyar' (malaria) for two years. In the past, there were a lot of villagers suffered from the disease." (U KT, village leader and farmer)*

Malaria knowledge in the past is based on traditional beliefs. Eating fruit in the forest, drinking bad water, bad weather and season, and angry spirits of the forest are various beliefs regarding causation of malaria disease.

> *"In the past, people used to believe tha 'Hnget-phyar' is caused by bad water and some also believed that it is caused by 'Taw-kine' or 'Net-kine' as a result of wrong speech or wrong behaviour in the forest." (U WA, villager and farmer)*

The extensive community mobilization campaigns by government and NGO malaria projects changed the knowledge, perception and attitude of villagers towards malaria.

> *"We provide mass health education programmes to distribute proper knowledge and change the attitude of villagers towards malaria." (Dr X, medical doctor)*
>
> *"There were health education sessions in our village at least 2-3 times each year since 2007. It was done by persons from the malaria project. 'Saya' and 'Sayama' explained about 'Hnget-phyar' and prevention*

methods repeatedly to make sure we don't forget the knowledge." (U WA, villager and farmer)

"Hnget-phyar is a disease caused by a 'Hnget-phyar Poe' (malaria parasite) which is carried by 'Hnget-phyar Chin' (malaria mosquito). That 'Chin' (mosquito) bites at night so sleeping inside a 'Chin Htaung' (bed net) is important and can prevent 'Hnget-phyar'. It is much better to use 'Say-sein Chin Htaung' (ITN)." (Daw Nan New, villager and shop keeper)

"Say-sein Chin Htaung (ITNs) are better in preventing Hnget-phyar compared to 'Yoe-yoe Chin Htaung' (ordinary bed nets)." (U MO, villager)

"If there is 'Aphyar' (fever), the 'Thway' (blood) should be checked for the presence of 'Hnget-phyar Poe' (malaria parasites)." (Daw SY, villager and shop keeper)

"You should not treat 'Hnget-phyar' yourself. There are different types of 'Hnget-phyar Poe' (malaria parasite). The type of drug to treat Hnget-phyar differs depending on the type of Hnget-phyar Poe." (U KT, village leader and farmer)

For malaria treatment, there are few medical doctors, some midwifes and health assistants who open their own private clinics in town and large villages while there are quacks dominating in many smaller villages. Self medication to treat malaria is common and there are many groceries which sell anti-malaria drugs. The local authority cannot control the illegal selling of medicines as in other parts of Myanmar. People from the area also used other methods to treat malaria such as traditional herbal medicine and treating with spiritual healers. In 2006, one villager, from Mae Hon Village, suffered from cerebral malaria, was treated with traditional Nat Pwe (a kind of homage ceremony to local spirits organized by Nat Saya, spiritual teacher, which might be classified as animism practice) and was died of cerebral malaria.

4.2 Background information of the respondents, life of beekeepers and social relation within migration

4.2.1 Characteristics of beekeepers interviewed

The basic characteristics of the migrants interviewed can be summarized in the following table.

Table 4.1 Characteristics of beekeepers interviewed

Sr	Beekeeper Pseudonym	Age (Year)	Sex	Marital Status	Education
1	Aunty Aye	55	Female	Married	Grade 9
2	U Lay Maw	42	Male	Married	Grade 10
3	Ko Thu	23	Male	Single	Grade 10
4	Ko Thet	23	Male	Single	Grade 10
5	Ko Tun	27	Male	Single	BA
6	Ko Myo	26	Male	Single	Grade 10
7	Ko Naing	24	Male	Single	Grade 10
8	Ko Soe	19	Male	Single	Grade 10
9	Ko Cho	23	Male	Single	Grade 10
10	Aunty Lu	67	Female	Married	Grade 10
11	U Lay San	64	Male	Married	Grade 9
12	Ko Oo	40	Male	Married	Grade 10
13	Ko Toe	32	Male	Single	Grade 10
14	U Lay Htoo	60	Male	Married	BA
15	Ko Ye	20	Male	Single	Grade 7
16	Ko Kyaw	22	Male	Single	Grade 8
17	Ko Kyi	34	Male	Married	Grade 9
18	Ko Min	38	Male	Married	Grade 6
19	Ko Maung	40	Male	Married	Grade 10
20	Ko San	27	Male	Married	Grade 4
21	Ko Zaw	35	Male	Single	Grade 8
22	Ko Chit	42	Male	Married	Grade 11
23	U Kyaw	44	Male	Married	Grade 11
24	U Aung	42	Male	Married	BA
25	Ko Pyi	45	Male	Single	BA

4.3 Life of beekeepers

4.3.1 Origin and migration

Bee keepers are coming from different places of Myanmar. The origin and native places of migrant beekeepers differ from each other. Their homes are situated in Yangon, Mandalay, Magway, Sagaing Regions and Kachin State.

Figure 4.2 Map showing the original places of migrant beekeepers

The pattern they move from one State/Region to another is related to the available of flowers blossoms for their bees. Most of them arrive in Nawnghkio Township in early July for feeding season of two monks. They left Nawnghkio area by the end of August and early September. The honey production season starts in September when some of them move to Sagaing Region (where there are a lot of plum trees blossoming) and some of them go to Kachin State (where there are natural flowers blossom) while some of them remain in Nawnghkio area (where there are sesame flowers blossom). Again in October, some of those who are in Sagaing Region

move back to Nawnghkio area (where various kinds of crop flowers and natural flowers blossom) and some of them go to Kachin State to combine with those already there. They produce honey until the end of June. July is the feeding season because there is no or insufficient flower blossom everywhere and the beekeepers feed their bees with sugar solutions. All of them move back to Nawnghkio area for the feeding season where the temperature and the environment is the best for the insects including bees and mosquitoes. During the feeding season, the beekeepers try to increase the number of beehives as well as the bee population, in preparing for the production season.

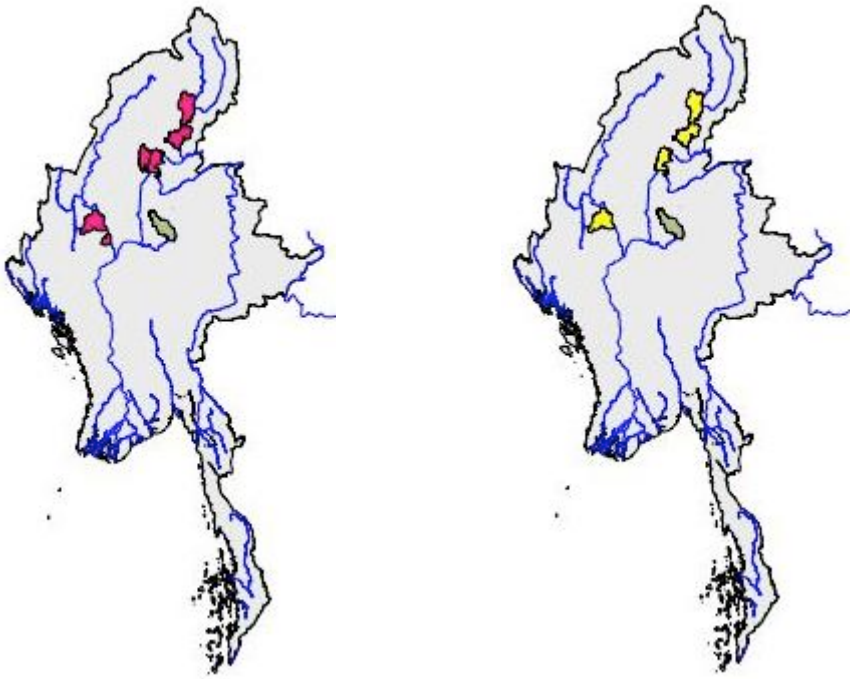

Figure 4.3 Map showing pattern of seasonal movement of migrant beekeeper groups from one area to another within the country. Left: In late June and early July they move to Nawnghkio (green area) from other places (red), Right: In late August and early September they move from Nawnghkio (green) to other places (yellow).

Each of them has its own annual movement pattern. Most of them usually arrive into the township in July, when most of the malaria cases are found. They stay in Nawnghkio Township during July and August which is the feeding season of their

bees. During the feeding season, there is no abundant flower blossom in any place. Bees cannot find their food. Bee keepers have to feed their bees with sugar solutions. Nawnghkio Township weather is the best for the bees during the months of July and August. So most of the bee keepers move into this township to feed their bees and they can also reinforce their bee colonies.

> *"Now I'm in Nawnghkio. I'll move to Chaung Ma (village) which is close to War Ye Village in Budalin Township (together with Saya Aung Pyi Soe). I can produce 'Zee Pyar' there. (Zee = plum, Pyar = Pyar Yay = honey so Zee Pyar refers to honey produced from plum flowers). The plum honey produced there is better than that produced in Kanni. The difficulty there is there are birds which eat bees. They are a kind of small green birds, called 'Ba Zin Doe'. The size is slightly bigger than the size of sparrows. 'Poat Thin Nyo' (Lizards) also eat bees." "After Budalin, I'll go to Myit Kyee Nar." (Aunty Lu, beekeeper)*
>
> *"I was in Myit Kyee Nar for 7 months before I came here. I kept my 'Pyar Pone' (beehive boxes) in the south edge of the city, in Dee Lon Ward, near the agriculture vegetations." "After Nawnghkio, I'll move to Kywe Thauk Kan Village in Kanni Township, on the way to Alaungtaw Katthapa National Park." (U Lay Maw, beekeeper)*
>
> *"I stayed in Kanni, Mandalay, Saga Inn Village in Tada U Township, Yangon and Aung Pan." (Ko Tun, beekeeper)*

The most challenging period for a beekeeper is when they move from one region to another. Most of the beekeepers lost their bees while they move from one region to another.

> *"I had 100 'Pyar Pone' (beehive boxes) in Katha. When I moved from Shweku in Katha Township to Nawnghkio Township this month, I lost 60 of my hives on the way. Other beekeepers experienced the same. It took 1 day and 2 nights to arrive here. When the beehive boxes are stacked on the top of one another on the truck, the ventilation was not good and the temperature was so high that bees are dead. Because we tried to carry everything in a single truck, the truck was full and everything on the truck was stacked." (Ko Naing, beekeeper)*
>
> *"It cost 900,000 kyats to rent a truck from Katha to Nawnghkio. A truck can carry up to 350 beehives. For two beekeepers, we rented 3 trucks. But if we rent here it will costs 450000 kyats per truck." (Ko Naing, beekeeper)*

Figure 4.4 A truck on highway road arrived in Nawnghkio Township in July 2013 carrying beehive boxes

4.3.2 Religion, ethnicity and language

Out of 25 beekeepers interviewed, 23 are Buddhists whilst 2 are the Christians (Baptists). All of the Buddhist beekeepers seem to have little or no interest in the religion due to their busy work.

> *"I cannot go to the 'Phone-gyi Kyaung' (monks' monastery) or celebrate in the 'Pwe-lan' festival events held by the local villagers. I'm busy and I cannot give time for that." (Ko Chit, beekeeper)*

> *"Today there is a 'Ka-htein Pwe' (Kathina ceremony) in 'Kyu Inn Kyaung' (the monastery in Kyu Inn Village). People donate robe to monks. But we have our work here. It is important to produce 'Pyar Yay' (honey)." (Ko Min, beekeeper)*

Only one Baptist lady goes to church regularly.

> *"I'm a Baptist. I go to 'Phayar Kyaung' (Church) in Bant Bwe. I always prey for the whole country to be peaceful and not in danger." (Aunty Lu)*

Table 4.2 The origin, ethnicity, language ability and religion of beekeepers interviewed

Sr	Beekeeper Pseudonym	Origin	Ethnicity	Language	Religion
1	Aunty Aye	Namtu	Shan-Bamar	Myanmar, Shan	Buddhist
2	U Lay Maw	Myit Kyi Na	Maram (Kachin)	Myanmar, Kachin	Baptist
3	Ko Thu	Myit Kyi Na	Shan	Myanmar, Shan	Buddhist
4	Ko Thet	Myit Kyi Na	Shan	Myanmar, Shan	Buddhist
5	Ko Tun	Myit Kyi Na	Shan	Myanmar, Shan	Buddhist
6	Ko Myo	Myit Kyi Na	Shan-Kayin	Myanmar, Shan, Kayin	Buddhist
7	Ko Naing	Budalin	Bamar	Myanmar	Buddhist
8	Ko Soe	Kyauk Pa Daung	Bamar	Myanmar	Buddhist
9	Ko Cho	Katha	Bamar	Myanmar	Buddhist
10	Aunty Lu	Myit Kyi Na	Kachin	Myanmar, Kachin	Baptist
11	U Lay San	Kyeng Ton	Lahu	Myanmar, Lahu, Chinese, Shan, Thai	Buddhist
12	Ko Oo	Thonze, Nawnghkio	Bamar	Myanmar	Buddhist
13	Ko Toe	Ohn Chaw	Bamar	Myanmar	Buddhist
14	U Lay Htoo	Yangon	Bamar	Myanmar	Buddhist
15	Ko Ye	Ma U Bin	Kayin-Bamar	Myanmar	Buddhist
16	Ko Kyaw	A Phauk	Bamar	Myanmar	Buddhist
17	Ko Kyi	Htee Chaink	Bamar	Myanmar	Buddhist
18	Ko Min	Mezar	Shan-Kadukanan	Myanmar, Shan	Buddhist
19	Ko Maung	Mezar	Shan-Kadukanan	Myanmar, Shan	Buddhist
20	Ko San	Mandalay	Bamar	Myanmar	Buddhist
21	Ko Zaw	Htee Chaink, Kathar	Bamar	Myanmar	Buddhist
22	Ko Chit	Sagaing	Bamar	Myanmar	Buddhist
23	U Kyaw	Pwint Phyu	Bamar	Myanmar	Buddhist
24	U Aung	Sagaing	Bamar	Myanmar	Buddhist
25	Ko Pyi	Myit Kyi Na	Bamar	Myanmar	Buddhist

Mix of ideas from different regional settings can be seen. It will be discussed in detail later in this chapter. Being staying in the same country, most of them are sharing *common cultural and traditional* backgrounds. There are some differences depending on the location of their origin. *Ethnic diversity* is also observed

among the bee keepers. But all of them are found to use Myanmar language fluently but with different accents.

> *"I'm Shan-Kadukanan hybrid and she's a Burman. We met in Bant Bwe village". (Ko Min, beekeeper)*
>
> *"I'm a Shan-Bamar. So I can speak both Shan and Myanmar languages". (Aunty Aye, beekeeper)*
>
> *"I'm a Kachin from Myit Kyee Nar. I speak Kachin as well as Myanmar." (Daw Lu Taung, beekeeper)*
>
> *"I'm a Maram, a kind of Kachin ethnic group." (U Lay Maw, beekeeper)*
>
> *"I'm a Lahu born in Kyeng Ton in Eastern Shan State. I can speak Lahu, Myanmar, Chinese, Shan and Thai languages." (U Lay San, beekeeper)*
>
> *"I'm a Burman born in Kyaukse Village in Sagaing Township." (Ko Chit, beekeeper)*
>
> *"I'm a Shan-Kayin hybrid." (Ko Myo, beekeeper)*
>
> *"My father was Burman and my mother was Kayin. So I'm a Kayin-Bamar hybrid." (Ko Ye, beekeeper)*

4.3.3 Previous work experience and reason for becoming a beekeeper

Diverse and colourful past experiences is a feature of migrant beekeepers. The previous work experiences of the beekeepers are found to be respectable and included teacher, clerk, boat driver, seller, peasant, farmer, gardener, student, jade industry worker, handicraft, company employee, etc.

> *"The teacher taught me how to make Kachin 'Badee' (rosary beads). So I started making Kachin Badee. The teacher sold for me. At that time, a coin of "Ta Mat" (one-fourth of one Myanmar Kyat) can buy noodle for 3 persons. I made 50 Kyats per week." "I served for the government until 1975. Now I'm 67.' "After 1977, the price of rice raised and I could not stay as government staff so I resigned. I was a school teacher then in Namtee. After a sugarcane factory opened there, I worked as a clerk in the factory. When the rice price rose, I resigned and went to Phakant (jade land in Kachin State)." (Aunty Lu, beekeeper)*
>
> *"Previously I worked in Phakant (in Jade production work)." (U Lay Maw, beekeeper)*
>
> *"I worked in an agriculture garden in Myit Kyi Nar." (Ko Thet, beekeeper)*
>
> *"I worked in Hmaw (Pakant Jade Production) previously." (Ko Si Thu, beekeeper)*

"First I was a peasant. Then I became a boat driver. I drove 'Shor Tel' (= local term for a kind of motorboat in Chin Twin River) between Kalaywa and Monywa for two years. After that, I worked in a vegetable garden of my elder sister in Ohn Kyaw for two years." (Ko Naing, beekeeper)

"Previously I was just a high school student and I didn't pass the exam. Ko Than Htay from my village is a 'Pyar Tha-mar' (beekeeper) and I followed him to learn beekeeping." "As a student, I helped my mother in holidays. I followed her to Kyaukpadaung Market place. Mother bought tomatoes from 'Pwe Yon' (the broker house) and sell to vendors in the market. I did the same thing but not with tomatoes but with other crops and vegetables. Sometimes I take a holiday myself and go back to my village and help my mother. Father is a gardener. He has one acre of land. He grows some mango trees and plum trees. He also grows sesame." (Ko Soe, beekeeper)

Initial reasons for becoming a beekeeper are close relationship with beekeepers, future hopes for a better job, curiosity, hobby and unemployment.

For this man, his previous work place is notorious for drug addictions and heroin. So he stopped the previous work and moved to the beekeeping business.

"Previously I worked in Pahkant (in Jade production work). My parents didn't like when I worked in Pahkant. The reason is there are a lot of drug addiction problems there. 'Bein Phyu' (Heroin), 'Bein Me' (a kind of low concentration heroin) and other kinds of drugs are available there. After that I worked as a 'Pyar Tha-mar' (beekeeper) for the government. After 5 years with the government, I resigned and worked for my own." (U Lay Maw, beekeeper)

These men did not like the previous agriculture work because of lack of interest and because of poor profit, and they followed his brothers as a learner.

"I didn't like that job which was not interesting and was boring, and followed my elder brothers to their apiculture business. I'm a learner here." (Ko Thet, beekeeper)

"I became a 'Pyar Tha-mar' (beekeeper) three years ago. Because the land is not fertile, he cannot make a lot of profit. It is just enough for the living. I'm the eldest among my siblings." (Ko Soe, beekeeper)

For this person, he was employed previously after completing his university study.

"Previously I was a student. I became a government beekeeper when I was graduated from Myit Kyee Nar University." (Ko Tun, beekeeper)

This man escaped from the war which occurred in his previous work place. He met his cousins doing beekeeping business and he became a beekeeper.

> *"After there are wars between the government army and KIA, I came back from Pakant. I became a beekeeper because of my elder brothers (cousins)." (Ko Si Thu, beekeeper)*

> *"I met beekeepers staying and working near my sister's garden. I studied 'Pyar Lot Ngan' (apiculture) just for my knowledge." (Ko Naing, beekeeper)*

Once they started the beekeeper's life, they found that it is a good business and their main reason to be a beekeeper becomes the expectation of high income.

> *"But after two to three months with them, I found it was very interesting and can make a lot of profit and I decided to continue my life as a 'Pyar Tha-mar' (beekeeper). So I became a Pyar Tha-mar until now." (Ko Naing, beekeeper)*

Beekeeping (or apiculture) is the study and management of honeybee colonies, usually in hives which are kept in a bee yard (or an apiary), by beekeepers (or apiarist), for the production of honey and bee products (such as beeswax, propolis, pollen and royal jelly), pollination of crops and/or production of bees to be sold to other beekeepers. It is "a feasible way to help people to work their way out of poverty, while at the same time maintaining natural biodiversity" (BfD, 2010).

> *"The bee species in bee industry in Myanmar is of European origin. This year, a bee scientist from Israel brought a species to Myanmar. That species will be cross-hybridized to produce a better bee species." (Ko Chit, beekeeper)*

The beekeeping business needs special knowledge and skills. It is not so easy for a beginner. It needs interest, hard work and careful teaching from an experienced senior. The beekeepers interviewed were found to have rich knowledge, experience and skill with their business.

> *"This is 'Pyar Baung' (the frame). The frame is made of teak and some wires. This is the foundation made from 'Pyar Phayaung' (beeswax) using a handheld foundation roller machine. Beeswax is pressed against the frame to get this foundation. Newly pressed foundation is a thin layer of beeswax with hexagonal beehive-cell-shaped imprints on both of its surface. I have to buy foundation from China or from Thailand. Some*

beekeepers have roller machines and they can make foundations themselves. When a frame with a new foundation is kept in a wooden box of beehives, the worker bees start building beehives on the foundation." (Ko Chit, beekeeper)

Figure 4.5 A beekeeper taking a 'Pyarr Baung' (frame of beehive) out of a 'Pyar Pone' (beehives box)

To know the nature of the bees is crucial for a beekeeper. The economy driven informants were found to be earnest in their business. The beekeepers know about the nature of the bees very well.

"Pyar Ba-yin-ma (Queen) is important in a bee colony. There is only one queen in a bee colony. It lays eggs in empty cells. Some of its eggs hatch to become males, some become drones or guards, some become nurse bees and some become foragers that collect nectar and pollen. If a queen dies, another queen is replaced naturally or artificially. We practice artificial replacement." (Ko Chit, beekeeper)

"We can produce queens artificially using a beehive. To hatch queens, we need a beehive without any queen. We can select a beehive and remove the queen. Then a frame of artificial beehive cells (which is specially designed for the hatching of queens) is placed in that beehive. After an hour, we placed one-day old larvae into those cells. Then you just need to wait for the queens to be hatched from those cells." (Ko Naing, beekeeper)

Beekeeping industry has passed processes of evolution to reach technical achievements today. The most ancient bee was discovered from within an ancient amber crystal found in a mine in Kachin State, Myanmar (G. O. Poinar Jr. & B. N. Danforth, 2006). In Myanmar, Kachin people in the north of the country used to domesticate and keep naturally occurring local bee species traditionally.

> *"On the mountain, my grandfather domesticated naturally occurring "Myat Mway Lein Pyarr" (a kind of bee species occurring in Kachin State) using cavity of bamboo. They are a kind of small bees that used to stay inside the wood cavities naturally. But they are not "Thit Khaung Pyarr" (a kind of larger bees that stay inside wood cavities). Thit Khaung Pyarr is similar to "Mway Myu Yae Pyarr" (domesticated bee). That one is very small in size, just like "Phyoat" (sand-fly, very small insect and just like fly). My 'A Phoe' (grandpa) hanged it at home. Kachin people called bee pollen as "Pyar Chee" (= bee shit) and they eat it." (Daw Lu Taung, beekeeper)*

It was the government who encouraged beekeeping industry since 1979 when the country was under the rule of Myanma Socialist Party (MoLF, 2013). The "Beekeeping Division, Livestock Breeding and Veterinary Department" and the "Apiculture Research and Development Unit (ARDU)" is working under the "Livestock Breeding and Veterinary Department" of the "Ministry of Livestock and Fisheries (MoLF)" (ASTI, 2007; MoLF, 2013).

> *"There was special apiculture training during 1980's organized by Myanmar Socialist Party at that time. I was trained in one of those trainings and was appointed as a government staff. I go a lot of experiences during my life as a government staff". (Ko Chit, beekeeper)*
>
> *"U Aung Win, who is one of our villagers, was a Pyar Kay Dar trained person working for the government in Shan State as a state officer. Villagers from my village started beekeeping business after him". (Ko Naing, beekeeper)*
>
> *"I'm here on duty as a government staff. I'm responsible for beehives owned by the ministry. It's a kind of private-public partnership. There are 225 beehives owned by the government. I've 30 beehives of my own." (Ko Tun, beekeeper)*

A beginner can start as a learner beekeeper without any investment. As a beginner, he can get free food, free accommodation, free training and a salary of 30,000 kyats from his 'Saya' (= teacher = trainer = employer = the person who

introduced him to the beekeeping industry and who takes the responsibility for him). He has another choice instead of salary, i.e., he can choose to take beehives after one year. Some of the beginners take the salary and some take beehives. Once he has his own beehive boxes, he has to start his own life as a beekeeper.

> *"I'm a beginner. So, I don't have my own 'Pyar Pone' (beehives) for the moment." (Ko Si Thu, beekeeper)*
>
> *"I'm learning apiculture now." (Ko Thet, beekeeper)*
>
> *"As a beginner, I worked for Ko Than Htay for 3 years and 3 months during which he gave me free food, free accommodation and free training and I learnt apiculture. After 3 years, he gave me 15 beehives." (Ko Naing, beekeeper)*

For the government staffs, they get the government salary as well as the profit from the business.

> *"The Myanma Bee Enterprise is working in 70 townships in Myanmar. For each township, there's an officer, second officer, assistant bee yard supervisor, second assistant bee yard supervisor and bee yard workers. All the staffs are working together with the private beekeepers." (Ko Pyi, beekeeper)*
>
> *"I get 84,000 kyats per month as a government staff plus travelling allowance and some allowances for the business. Allowances are calculated based on the number of beehives I'm working with. Now I'm working with 225 beehives owned by the government and 30 beehives of my own. I've to report every month. Every year, I've to give a determined amount of honey to the government. I get the extra honey. If I cannot give the mentioned amount to the government, I've to buy honey from other beekeepers to give to the government." (Ko Tun, beekeeper)*
>
> *"I'm working for the government and get 60,000 kyats per month. In the beginning, the salary is less." (Myo Nyein, beekeeper)*

The income of a beekeeper depends on many factors such as number of beehives he own, bee population, amount of flower, weather, etc. Income is generated throughout the honey production. Honey production season lasts for nearly ten months (about 39 weeks) each year (September to June). Since honey is produced every 8 to 10 days, a beehive can be produced from 27 to 34 times a year. One hundred beehives, each time, can yield one and a half plastic barrel (which can hold 180 viss/648 pounds/294 kg of honey) which is sold for 270,000 Kyats (Shwe et al., 1993). So a

beekeeper who owns 100 hives can earn 405,000 to 540,000 Kyats every 8 to 10 days. It means one beehive can earn 4,050 to 5,400 Kyats every 8 to 10 days. The income in the table is estimated with the assumption that all the beehives have adequate bee population the number of beehives and the bee population is constant. The possible minimum annual income of a beginner was estimated to be 360,000 Kyats (423.5 US$) while the possible maximum annual income of a beekeeper who owns 1000 beehives was estimated to be 183,600,000 Kyats (216,000 US$).

> *"The honey in a plastic barrel is sold for 270000 Kyats. One hundred 'Pyar Pone' (beehive boxes) can yield one and a half to two barrel every 8 to 10 days" (Aunty Aye, beekeeper)*
>
> *"Honey production rate depends on the bee population. Increased bee population means increased honey production. It also depends on the number of flower blossoms available in the area. If there are more flowers, there'll be more honey." (Ko Chit, beekeeper)*
>
> *"Previously, I had 300 'Pyar Pone' (beehive boxes). Now I sold 100 hives and so I have 200. I sold by 20,000 kyats for each hive without the box. So it cost 2,000,000 for 100 hives. But I discounted to 19,500,000 Kyats only." (Aunty Lu, beekeeper)*
>
> *"I've 40 'Pyar Pone' (beehive boxes) for the moment. I had 100 hives when I was in Katha before I move here last month." (Ko Naing, beekeeper)*
>
> *"I had 80 'Pyar Pone' last month. But now I only have 36 hives. I lost my hives on my way from Katha to Nawnghkio. All the bees and larvae dried because of the heat." "I started my carrier with 13 beehives." (Ko Soe, beekeeper)*
>
> *"The bee population can be reduced by various reasons. Lizards, birds and some kinds of insects kill and eat bees and can reduce the bee population. Termites also destroy the beehives. Bees are also venerable to various infectious diseases which need careful monitoring and action." (Ko Chit, beekeeper)*
>
> *"If there's no disturbance from the villagers, beekeepers will be very rich." (Ko Chit, beekeeper)*

Destruction of beehives by the local villagers can also significantly affect the honey production which is discussed later in this chapter.

Table 4.3 Estimated total annual income (in Myanmar Kyats) of beekeepers (Exchange rate during the survey period was around 850 Kyats per 1 US$.)

Sr	Beekeeper Pseudonym	No. of hives	Income (Minimum)	Income (Maximum)	Average Income	Income from Salary	Total Income
1	Aunty Aye	500	54,675,000	91,800,000	72,056,250	0	72,056,250
2	U Lay Maw	140	15,309,000	25,704,000	20,175,750	0	20,175,750
3	Ko Thu	0	0	0	0	30,000	360,000
4	Ko Thet	0	0	0	0	30,000	360,000
5	Ko Tun	30	3,280,500	5,508,000	4,323,375	84,000	5,331,375
6	Ko Myo	0	0	0	0	60,000	720,000
7	Ko Naing	40	4,374,000	7,344,000	5,764,500	0	5,764,500
8	Ko Soe	80	8,748,000	14,688,000	11,529,000	0	11,529,000
9	Ko Cho	60	6,561,000	11,016,000	8,646,750	0	8,646,750
10	Aunty Lu	200	21,870,000	36,720,000	28,822,500	0	28,822,500
11	U Lay San	700	76,545,000	128,520,000	100,878,750	0	100,878,750
12	Ko Oo	320	34,992,000	58,752,000	46,116,000	0	46,116,000
13	Ko Toe	60	6,561,000	11,016,000	8,646,750	0	8,646,750
14	U Lay Htoo	0	0	0	0	200,000	2,400,000
15	Ko Ye	0	0	0	0	30,000	360,000
16	Ko Kyaw	0	0	0	0	30,000	360,000
17	Ko Kyi	320	34,992,000	58,752,000	46,116,000	0	46,116,000
18	Ko Min	1000	109,350,000	183,600,000	144,112,500	0	144,112,500
19	Ko Maung	300	32,805,000	55,080,000	43,233,750	0	43,233,750
20	Ko San	80	8,748,000	14,688,000	11,529,000	0	11,529,000
21	Ko Zaw	60	6,561,000	11,016,000	8,646,750	0	8,646,750
22	Ko Chit	80	8,748,000	14,688,000	11,529,000	0	11,529,000
23	U Kyaw	0	0	0	0	92,000	1,104,000
24	U Aung	0	0	0	0	92,000	1,104,000
25	Ko Pyi	0	0	0	0	110,000	1,320,000

4.3.4 Daily Life of beekeepers

Regarding their work life, in the feeding season (July and August), beekeepers check their bee colonies in the morning and feed the bees with sugar

solutions in the evening. Since it is the period of the year where malaria occurs most, there is more chance of geting malaria to work in the early morning and in the evening since the malaria mosquitoes start to bite in the evening until next morning.

> *"In the morning, I check the bees in 'Pyar Pone' to know whether they are healthy and to estimate the bee population. If there's any sign of a disease, I've to use various kinds of remedies to prevent bees from that particular disease." (Ko Chit, beekeeper)*
>
> *"We feed bees in the evening. We start feeding at 4 or 5 pm until it is dark. Because, when they are fed in the morning, all of their normal functions are compromised. They don't need to go out again after they're fed in the evening. Another thing is if they are fed in the day time, bees from other colonies will arrive and fight for the sugar. Another thing is if they are fed in the evening, they don't attack man. Some of the beekeepers who have a lot of colonies have to feed in the morning also since they don't have enough time." (Ko San, beekeeper)*

In the honey production season, they have to work the whole day. When they work the whole day, they are tired at the end of the day. For a tired person, there is more chance to neglect the mosquito bite during sleep and so there is more chance of getting malaria.

> *"Everybody in the group get up in the morning and prepare for the day's work. After having breakfast, there comes the day light and we started producing honey. There's a lunch time break in the afternoon. We continue our work after the break until day light goes off. Being tired, sometimes I go to bed without preparing my bed net. I cannot know mosquito bite while sleeping because I was so tired and sleeping soundly." (Ko San, beekeeper)*
>
> *"We start working before the morning light comes. When the light comes, at 4:30 or 5:00 am, we are already in the bee yard and start honey production. Morning work session ends at 11:00 am. In the afternoon, the work starts at 2:00 pm until 3:30 pm. The work depends on the condition and nature of bees. Bees work in the presence of day light. If it is cloudy, we cannot produce honey. Bees are more aggressive in the early morning at dawn and in the evening at sunset when the day light starts to dim. They are also aggressive in the cold weather." (Ko Min, beekeeper)*

Some of them stay outside of the local villages in tents while some rent cheap places for their accommodation while they are in Nawnghkio Township.

> *"We rented this place for 2 months. In Kanni, we live in tents. There, that is the tent. Although we are not using it right now, we carry it along so that if we cannot find any roof to stay, we can build a tent easily". (Aunty Aye, beekeeper)*

Some of the rented buildings were fair enough for staying while some were staying under buildings which only have roofs made of iron sheets and unsmoothed brick walls without any window or door. The walls are not good. Those buildings are also not able to protect people inside from mosquitoes.

> *"Here we rented a house in the village for 50,000 kyats just like in last year. We built tent when we were in Budalin." (Daw Lu Taung, beekeeper)*

Others were staying in tents close to their bee yards. The tents are made of tarpaulin sheets as roof. The tents are open on one or two sides with tarpaulin sheet walls on the other sides. It was very hot inside a tarpaulin tent especially in the afternoon. At night when the environment becomes cold, the tent cannot provide full protection for the person inside. The tent also cannot prevent mosquitoes from coming in. So, all the buildings are not good enough to protect the beekeepers from mosquitoes.

> *"This tent is easy to make and is also easy to carry. We use it everywhere we arrive. It is cold at night so we have to carry enough blankets." (Ko Min, beekeeper)*

Whether they are staying outside, close to or inside any village in Nawnghkio Township, they are at risk of malaria since there are many small rivers flowing in many places.

Figure 4.6 Tent of a migrant beekeeper group between Taw Moon and Lwe Ngynn Villages

All the beekeepers, singles and couples, sleep together under the same roof among the stocked items and utensils. For singles, they made a large bed where all of them can sleep together beside each other. For couples, they made a separate bed at a separate corner of the tent or building. The bed is usually made on the top of a series of wooden boxes (beehive boxes which were not in use) equally stacked together. Usually, a plastic mat is put on the top of boxes. On the top of the mat, a mattress covered by a bed sheet is put. They also used one or more blanket/s depending on the environmental temperature when they sleep. Most of them used bed nets, the ordinary one, but none of them were using ITN during the observation. Although some beekeepers said they sleep under the bed nets, it was observed that sometimes they forgot to prepare their bed net before sleeping and so they were not sleeping under the bed net.

"This is the storage place. At the same time this is the living place as well as dining place during the day time, and is the sleeping place at night". (Ko Naing, beekeeper)

"Sometimes, I'm very tired and so I went to bed without bed net." (Ko San, beekeeper)

Figure 4.7 Inside a beekeeper resident building which is a living place, sleeping place, cooking place and storage place

"There is only one tent. So all of us stay and sleep together in this tent just like a family. We're a couple, so we sleep in this side of the tent. They are singles and this is their sleeping place." (Ko Min, beekeeper)

Bee keepers bought rice, salt and vegetable oil for the whole year. While they were in Nawnghkio, they went to every-fifth-day markets to buy vegetable, meet and other things they need. A group of beekeepers staying in a tent usually cook together.

"Every year at the beginning of the bee-feeding season, we borrow money from the company to buy food for people and sugar to feed bees. We finish all the sugar in two months of feeding season in Nawnghkio. We have to carry food when we move to other places." (U Lay Maw, beekeeper)

Figure 4.8 Lunch time of beekeeper life

> *"We cook together and we have our meals together. If one is making fire, another one will prepare rice for cooking while the other prepares vegetables and meat for the curry. At the same time, others will prepare for day's work" (Ko Naing, beekeeper)*

They cook using fire made from wood or coal. They bought the wood or coal locally. All of the tents had batteries for electric lighting at night. Some of them also use batteries to charge their torch lights and mobile phones. I saw one group of beekeepers using solar panel to recharge their battery. Other groups go to battery recharge shop of the nearest village to recharge their batteries.

> *"We cook just here (under the tree) using wood for fire. The wood is cheap and sometimes we use coal for fire for cooking." (There was a stove made of a triangle of three stones on the ground with wood fire. A pot was placed on that stove.) "Battery is just a small one. It is difficult to recharge and so we keep it for charging of phone and DVD player. We use LED*

lights just in the early part of night to save battery." (Aunty Aye, beekeeper)

Men wore shirts/tee-shirts and longyi/Pasoe/trousers/three-quarters. Ladies wore blouse/shirt and longyi/Htami/Htamein. The clothing was the same whether they were at work, out of work or in bed. When they work, they wore protective hats with nets to cover the face from the bee sting attacks. The beekeepers call it 'Pyar Oak Htoat' (= bee hat).

"It's just the combination of ordinary hat and net. It is used to prevent our faces being attacked by bee sting. Our faces have been attacked by bees many times." (Ko Naing, beekeeper)

Figure 4.9 Beekeepers working together for honey production

Because of the weather, they cannot wear mosquito-protective long sleeved clothes in the evening and at night. It is found to be risky since the area is malaria endemic.

"Feeding for bees is in the evening and it is nearly dark. There are many mosquitoes. But it is not convenient to work with long-sleeved clothes." (Aunty Aye, beekeeper)

4.3.4.1 Hobby and leisure activities

Most of them visit camps of other beekeepers and other migrants. Some read, listen to music or watch movie while others play sports, play cards or sing songs.

"I don't read journals or newspapers. If I'm free, I read the bible. I never listen to the radio or watch television. They will make me confused." (Aunty Lu, beekeeper)

"We play cards together in our free time." (U Lay Maw, beekeeper)

"I read journals. Sometimes I watch movies with portable DVD player." (Myo Nyein, beekeeper)

"I sit around with my friend beekeepers for a chat if there's free time. I also play 'Paik Kyaw Chin' (Sepak takraw) in Hton Kon (a village of migrant workers). I also play cards and listen to the radio. I didn't bring TV. Sometimes I read journals (entertainment journals)." (Ko Naing, beekeeper)

"I play cards with my friends in my free time". (Ko La Maw Naw, beekeeper)

"I chat with my friends and play with children. All are like children here." (Ko Soe, beekeeper)

"I play 'Paik Kyaw Chin' (Sepak takraw). It supports the healthiness. The body feels fresh with sweat after playing. The feeling is not good if there is no sweating." (Ko Cho, beekeeper)

4.3.4.2 Usefulness of honey and bee products in daily life

Beekeepers use honey and bee products in their daily life.

Honey is used for the purpose of nutrition.

"Honey gives strength." (Aunty Lu, beekeeper)

"Eating honey can stimulate the good appetite." (Ko Zaw, beekeeper)

Honey is used as eye drop for some diseases of the eye.

"If you got blurred vision, you can use honey as eye drop. It can cure after first or second dose although you'll feel spicy sensation in your eyes. I'm

wearing the eyeglasses but my eyes are quite good." (Aunty Lu, beekeeper)

"Honey can be used as eye drop for 'Myat Si Tein Kya' disease (= corneal opacity of eye). It is used for both traumatic and other 'Tein'. Ko Than Htay's brother-in-law got 'Tein' in his eye from caustic injury. He was cured after 15-20 days treatment with honey eye drop. Honey has corrosive action on opaque cornea tissue." (Ko Naing, beekeeper)

"A man cured his 'Myat Kyaw Hta' disease with red eyes using honey produced in Htee Chaink (honey produced from 'Pan-thone-sint or Pint-ku-hteik-peik' flowers which are known to cure centipede poison and naturally occur in that region). He felt improvement after 4-5 days and was cured after one and a half month." "I've also seen an ox with opacity in the eye which is cured using honey eye drop." (Ko Naing, beekeeper)

Honey is also used as a shampoo to cure headache.

"I wash my hairs using honey. Now I don't have any headache." (Aunty Lu, beekeeper)

Honey is also used for skin ulcers and trauma.

"Ulcers can be treated with honey. When I got injured my foot, I used honey because it is not relieved with oral medicines given by midwife." (Ko Naing, beekeeper)

"Honey can be used as a topical cream for minor skin injuries." (Ko San, beekeeper)

"When my leg got burn injury from contact with the hot exhaust pipe of motorbike, I applied honey on the burnt area. Now the skin is normal." (Ko Chit, beekeeper)

Some use honey as cosmetics

"He used to eat a spoonful of honey every morning and every evening. His complexion was really beautiful." (Aunty Lu, beekeeper)

"I had 'Tin Tate' (= freckles) in my face. I used honey topically and it disappeared." (Ko Chit, beekeeper)

"For persons whose eyebrow has sparse hair, honey can be applied." (Ko Zaw, beekeeper)

A combination of honey and bee pollen is used to cure acne and some skin disorders, together with peptic ulcer disease.

"There are many 'Wet Chan' (acnes), here in my face and also in my back of the body. Honey is mixed with bee pollen and I ate it one teaspoonful two times a day for one month. All of my 'Wet Chan' (acnes) disappeared. My 'Lay Nar' (peptic ulcer disease) is also cured at the same time." "This one, cracked heel, in my feet also disappeared.(showing smooth skin of his heel)" (Ko Zaw)

"Pyay Yay (honey) and 'Wut Hmon' (bee pollen) can be applied for bald head." (Ko Zaw, beekeeper)

Bee pollen is used as a nutritional supplement.

"Children can develop intellect if they eat Wut Hmon (bee pollen)." (Aunty Lu, beekeeper)

Bee poison is used to treat joint pain.

"In 1994-95, a Chinese from Chiang Mai arrived and requested to give him some bees. When he was asked for the reason, he said that the bee will be used to attack (puncture with the bee sting) the knee joint of his friend to cure knee joint pain." (Aunty Lu, beekeeper)

Bee poison is used as a remedy to cure some neurological disorders.

"Four years ago, ... , the old ladies in Nawnghkio town got 'Hton Nar Kyin Nar' (tingling and numbness sensation, a neurological disorder) of legs. They didn't feel any pain if someone prick the skin of those ladies with fingernail. When they are cured using bee sting, they felt nothing initially. After 3 to 4 times of 'Pyar Toat Hkan' (receive bee sting attack), they got the sensation again." (Aunty Lu, beekeeper)

"My teacher Ko Than Cho cured 'Lay Phyat Lu Nar' (a stroke patient) using bee poison. The patient was 40 years old. He was treated using bee sting for 20 continuous days and was cured. Previously, the patient could not walk himself. Normally, stroke patients need 1 and a half month treatment to cure if treated with bee poison using 20 bees daily. Some people got itchiness if they got bee sting allergy. It is only for stroke and not for other diseases." "It is not a Myanmar traditional method. This method is used by other beekeepers." (Ko Naing, beekeeper)

Some believe that bee poison can be used for infectious diseases.

"It was said that even the "latest disease" (it means HIV/AIDS) can be cured by 'Pyarr Toat' (Pyarr = bee, Toat = attacking action of bee)." (Aunty Lu, beekeeper)

"Pyarr Seik (bee poison) entered into the body by the action of Pyarr Toat (bee attack) kills 'Poe' (pathogenic microbes) in the body and Hnget Phyar (malaria) and AIDS strains in the blood vessels. But a single attack is not enough. Even the western medicine courses need 4 to 5 days to complete the course." (Aunty Lu, beekeeper)

"Pyarr Seik (Bee poison) can also kill malaria parasites." (U Lay San, beekeeper)

"I heard everyone said that anyone who got 'Pyar Toat Hkan' (bee sting attack) will not suffer from 'Mae Hkaing Yaw Gar' (tetanus)." (Aunty Lu, beekeeper)

Royal jelly is believed to be and used as a longevity remedy.

"This is 'Pyar Noh' (= bee milk = royal jelly). Try it. (It is a yellow-tinged white paste bee product. The taste is slightly sour.) It can give you longevity." (U Lay San, beekeeper)

Royal jelly is also used as a topical cosmetic.

"Try applying it on your face. (I applied royal jelly on my face for 15 minutes. I was cold. When a bee tried to attack my face because of the smell of royal jelly, I washed my face.) It can make your skin beautiful." (U Lay San, beekeeper)

Beeswax from the beehives is usually recycled to make foundation for beehives.

"Pyar Pha-yaung (Beeswax) is heated. Then it is filtered to purify. After that, it is pressed in this machine to get foundation." (U Lay San, beekeeper)

4.3.4.3 Life style at risk for malaria and occupational hazard

Beekeepers spend most of their time staying in working in malaria endemic areas where there are forests and water resources suitable for breeding of Anopheles mosquito species.

The observation finds out that honey production season is entirely a physical work and is tiring for the beekeepers. Nobody wants to wear long

sleeved shirt that can protect their body from mosquito bite. All of them are exhausted at the end of the day and all of them like to go to bed early after having the dinner. Nobody use insecticide treated bed net when they sleep. Most of them go to bed at night around 8:00 pm. Before they sleep, some of them sit around and chat. Some of them play cards. Some of them sing song or listen to music. There is no habit of using mosquito repellent.

> *"It is not convenient to wear long sleeved shirts or long pants while working. It'll be very hot." (Aunty Aye, beekeeper)*
>
> *"I usually go to bed early around 8:00 pm just like others since we get up early in the morning and have been working the whole day, and my body is tired." (Ko Min, beekeeper)*
>
> *"We don't use any mosquito repellent." "Before I started to work as a beekeeper, I never had Ngnet Phyar (malaria). I didn't care myself. Because beekeepers stay in 'Moe Kar Te' (tent made of tarpaulin) and it is very hot in the tent, I cannot wear any cloth when I sleep. I cannot cover my body while I sleep because it is very hot. I cannot even think of using any bed net or blanket. I never used bed net since I was a boy. But in the presence of my 'Saya' (= teacher/boss = Ko Naing who trained him to be a beekeeper) I use bed net because I respect him." (Ko Naing, beekeeper)*
>
> *"Everyone in this group has its own 'Chin Htaung' (bed net), the ordinary bed net. But some of them (including me) don't want to sleep under a bed net." (Ko Naing, beekeeper)*
>
> *"Did you say treat the bed net with insecticide? I've never heard of that kind of thing before." (Aunty Lu, beekeeper)*

Injury from being attacked by bee stings is common.

> *"Bee sting injury is quite often. If I wash my hands, there will be a lot of black spots. These are in fact bee sting marks caused by bee poison." (Ko Naing, beekeeper)*

Bee poison can be fatal if the attacked person or animal develop anaphylactic reaction.

> *"I saw an ox died from 'Pyar Toat' some 5 years ago. The animal was tied to a tree by a rope and it could not escape when the bees started attacking. So many bees attacked it." (Ko Naing, beekeeper)*
>
> *"My elder son is allergic to bee poison. So I cannot bring her together with me." (Aunty Aye, beekeeper)*

Bee poison is also dangerous if bee sting site was in the eyes.

"It (= bee poison effect caused by bee sting injury) can cause blindness if bees attack in the eyes." (Aunty Lu, beekeeper)

4.3.5 Job perception of beekeepers

Honey and bee products Market in Myanmar has a great potential to develop. Myanmar Apiculture Enterprise is working in 70 Townships of Myanmar. There is one Township Officer for each township together with other bee workers. The government staffs are working together with Private Bee Keepers. Combination of government and private aims to distribute the knowledge and practice of apiculture among the private sector and at the same time enhance the honey production of government teams.

For the beekeepers, the job is found to be interesting and they are happy.

"I'm happy doing beekeeping. I have some children helping me. I let them have good food. I don't care whether I got big profit or not. I buy clothes for them. We eat together in the same table." "The knowledge about the apiculture should be advertised in the newspapers and journals." (Aunty Lu, beekeeper)

"I'm interested in apiculture. It can be said that it is my hobby." (Ko Cho, beekeeper)

"I'm interested in the present job. I'm happy." (Ko Si Thu, beekeeper)

Apiculture industry is a good business for them with the potential to develop. Beekeepers found that compared to other jobs, beekeeping industry can make much more profit while there is less physical work and is more comfortable. There is a big honey and bee products market which is continuously expending making a good potential for their future. The beekeeping business is the only hope for the beekeepers to emerge from poverty.

"Compared to other jobs/business, you can work at beekeeping business with a smart style." "If you work in poultry farm, the chicken shit smells bad. Your body will be dirty all the time. In beekeeping, your hands will be dirty with beeswax but it is not that much. But you cannot use cosmetics with chemical perfumes. If bees get the smell, they will attack you. But you can just accept their attacking since bee poison is beneficial." "If you work as a school teacher, you must shout loud all the time. As a beekeeper,

you don't need to shout. You can just stay quiet, sing a song or recite religious things." "If you work in jade business, it depends on others who determine the price of your jade. If you don't know how to sell your jade, you'll lose your investment. I also lost." "You must be familiar with the nature of the work. You must be skillful. You must know how to feed bees. You must know in which direction the front of a beehive box must be facing. If you are skillful enough, you don't need to worry for your living." "The knowledge about the apiculture should be advertised in the newspapers and journals." (Aunty Lu, beekeeper)

"As a business, beekeeping is not so bad compared to other jobs. You can get profit only if you own a business." "This can earn more profit than the agriculture work. If it is in favour of weather condition, you can get back what you invested. The number of beehives can be doubled after a year." (Ko Naing, beekeeper)

"In bee business, even if you lost in this site, it is sure that you'll regain back in the next site. Compared to agriculture, the opportunity is better." (Ko Cho, beekeeper)

"Because there is a big market, many companies started investing in beekeeping business." (Aunty Aye, beekeeper)

"Myanmar is an exporter of honey and bee products for Japan, Malaysia, Thailand and China." (Ko Pyi, beekeeper)

"You don't need to take any leave. (It means you can take rest whenever you want.) I didn't receive any training from the government. I learnt from my work." (Myo Nyein, beekeeper)

"In my village, it's just enough for the survival although I worked together with my father and mother. If I can find a better job, I'll change my job." (Ye Myint Kyaw, beekeeper)

"The present job is not as bad as compared to other businesses." "It cam give more profit than the agriculture business. Now I don't want to do agriculture works." "Previously my sisters thought that 'Pyarr Thamar' (=beekeepers) don't have money. You can make a lot of profit if you can balance between your income and expenditure although the investment is big. In agriculture you cannot make 1500000 kyats net profit if you invest the same amount. (= beekeeping business can make a net profit of 100%). If the weather condition is good, you can get back your investment and the number of beehives can be doubled within one year." "It is comfortable without much physical effort in beekeeping. The investment is of the same amount as the agriculture. As a beekeeper, you'll be busy only at the time you move from one area to another. You just need to check the beehives every 4-5 days and at the honey production season, you have to produce every 8-10 days. You don't have much work in between. (He didn't mention the busy hours helping other friend beekeepers form the same group and other groups.)" (Ko Naing, beekeeper)

4.3.6 Perception on life and life's priorities

Their work and business was found to be the first priority in their life compared to healthiness or prevention from diseases.

> *"Priorities in my life are (1) To work, (2) to get money. But healthy living is also important." (Ko Si Thu, beekeeper)*
>
> *"To be a human being is quite satisfactory for me. The most important thing in life is to work for the survival. Marriage is also important." (Ko Thet, beekeeper)*
>
> *"Everyone have to create one's own life. My priorities in my life are my parents. Second priority is my work. Time is also important in life." (Ko Tun, beekeeper)*
>
> *"Work is more important than health. I don't like to sit while others are working. When compared, work is the first priority. Socializing is the second and health is the last priotity." (Ko Naing, beekeeper)*
>
> *"There are many important things in life. The most import thing is to get success with the business by trying yourself. My priorities in life are my parents and my younger sister. It is also important to stand on my own feet. Health is not important." (Ko Soe, beekeeper)*
>
> *"In my life, the first priority is my mother. Second most important thing is money. If there's no money, you're inferior, you don't have face and you'll be oppressed by others. If there's money, you can do whatever you want." "If there is no money, you dare not go into the community and you can't compare yourself to others. If there's money, you can bravely go into the community and you can face everything." "I was looking for a way for development of my life and I'm lost." (Ko Cho, beekeeper)*

4.4 Social relationship between beekeepers and other beekeepers, and local villagers

The eldest or the most experienced beekeeper is the leader in a group of beekeepers. Other beekeepers give respect to the eldest one. The eldest is usually the most experienced in a group and is able to guide, give suggestions, negotiate with local authority, companies and local villagers, and solve problems of others. It is the tradition seen almost everywhere in Myanmar and is the same among the local villagers.

> *"I'm happy doing beekeeping. I have some children helping me. I let them have good food. I don't care whether I got big profit or not. I buy clothes for them. We eat together in the same table. (She's the eldest and most*

> *experienced in her group and she's leading the group)" (Aunty Lu, beekeeper)*
>
> *"Previously, I had 300 beehives. Now I sold 100 hives and so I have 200. I'm forgettable for the last two years. I sold by 20,000 kyats for each hive without the box. So it cost 2,000,000 for 100 hives. But I discounted to 19,500,000 Kyats only. Let them get profit. I make wish for them." "I've no problem with the local villagers. It depends on your mouth. (it means how you speak to them) I also give honey to villagers as a present." (Aunty Lu, beekeeper)*

For beekeeper groups with couples, there were women in the group. For couples, the relationship between husband and wife is based on mutual respect and mutual understanding. Couples didn't bring their children to bee camps. The children remained in their native places. They are taken care of by their relatives and are attending schools.

> *"Bees like to attack. Ladies cannot tolerate the bee sting injury and they don't like to work as a beekeeper. But there are some ladies accompany their husbands in bee camps but they don't help in the business and just stay in the camp." "Beekeepers don't bring their children along their business trips. Children are kept in the native place for their education." (Ko Myat Min Oo, beekeeper)*
>
> *"The nature is the work is not suitable for girls. The village roads are not safe for girls to go. The responsibility for girls is great and there'll be a lot to worry for her. They have the enough physical strength to work in beekeeping but none of them want to do it." "When we move from one place to another, carrying beehives with trucks, they cannot ride the truck like men." "Everyone has to wait for a long time for they take too long to make beauty. I'm not patient to wait that long." (Ko Naing, beekeeper)*
>
> *"When men want to go out, it is not good to stay alone in the tent in the middle of the forest. (It is not safe for her.)" (Ko Chit, beekeeper)*

All the beekeepers within a group maintain a family like relationship with mutual respect. Beekeepers from one group usually visit other groups to help each other with their works and also for spending their free time chatting/playing cards.

> *"They (pointing to other beekeepers working nearby) are not staying here. Their camp is situated in another place. Today, they came to my place and help my work. Tomorrow, they'll stay in their camp while I'll visit them and help with their works. In that way, we are helping each other." (Ko Min, beekeeper)*

Figure 4.10 Beekeepers happily chit-chatting together in their free time

> *"My colleagues are just like my brothers, jut like a family." (Ko La Maw Naw, beekeeper)*
>
> *"All the beekeepers are friends. No one is dangerous for others. All are like brothers. We always make joke of each other and never fight or quarrel. All are of the same rank." (Ko Cho, beekeeper)*
>
> *"All are friends and we help each other's works." (Ko Soe, beekeeper)*

The favourite topic during their chit chats is usually the honey production of beekeeper groups and the honey market. No local villager is found visiting any of the beekeepers' places and on the other hand, beekeepers didn't make any visit to local villagers but they have relationships with other migrant groups. I was a very rare person who wished to visit their place and that's why they warmly welcomed me every time I arrived in their place. I felt that they virtually formed a separate community of beekeepers themselves without mixing up with the locals.

> *"If the beekeepers meet each other, we just discuss about which beekeeper can produce how much honey." (Ko Min, beekeeper)*
>
> *"In the full moon day, all of us stopped working and enjoyed a holiday. I went to Hton Bo Village and played Sepak Takraw there. Hton Bo is a village of migrant workers working in lime production." (Ko Naing, beekeeper)*

The beekeepers take caution when they make relationships to local villagers. They want to make a good relationship with them. They need to stay in harmony with the local people and they don't want to face with any problem. Some of the beekeepers had successfully made good relationships with some local villagers.

> *"I've no problem with the local villagers. It depends on your mouth. (it means how you speak to them) I also give honey to villagers as a present." (Aunty Lu, beekeeper)*
>
> *"The local villagers don't interest on us here. If we ask for help, they just help. There is no disturbance here. But in Kawlin, I always lost my beehives because of local villagers there. They just took the beehives away and eat honey. After that, the destroyed beehives are discarded" (Aunty Aye, beekeeper)*
>
> *"Local villagers are good. There is no problem with me." (Ko Si Thu, beekeeper)*
>
> *"I try to stay in harmony with the local villagers. Whether your beehives can be destroyed by the local villagers depends on whether that beekeeper gets the permission of the agriculture farm owner before he put his beehives. The farm has the right to get angry when the beehives arrived near his farm without his notice." "I always keep my beehives away from people so that bees will not attack people. Some children are very playful and they play with beehives and were attacked. But for the buffalos, the bee poison is fatal in large dose." (U Lay Maw, beekeeper)*
>
> *"I don't have any problem with the local villagers. They are good." (Ko Si Thu, beekeeper)*
>
> *"Local villagers are good. I visit them sometimes. There's no problem." (Ko Cho, beekeeper)*

Other beekeepers are still struggling for a successful relationship. They are struggling to change the perception and negative attitude of villagers towards the beekeeping industry so that they fully understand and accept the beekeepers and there will be no more disturbances with their beehives.

> *"The cultural backgrounds are different in different places. On the mountain (meaning Shan State), in Kanni and in Bamaw are quite different. Here in this place, people are hard-headed. Once they got an idea, they don't change it whether it is right or wrong. It also depends on the prioritization on education. In my village, education is the important priority for the people. Most of the people finish their high school education including me. People in Katha also don't prioritize education." "When we arrived in Nan Lon Village in Ya Mae Thin Township, just after 4-5 days of our arrival there, everybody was asking us to remove our bees*

back. They said that their crops have been crashed and destroyed because of our bees. There were a lot of problems there." (Ko Naing, beekeeper)

"Local villagers are quite different from one place to another. In Shwe Sar Yan Village in Patheingyi Township, local people don't mix with beekeepers. In Kanni Township, I have good relationship with villagers. Here in Ommakha Village, I don't have any friend from the village." (Hlaing Myint Htun, beekeeper)

"People are different depending on the location. In this place, people don't want to accept that we keep our beehives here. There are worried that their crops would not success because of our bees." "I had to go to the village just the day before yesterday for negotiation. They didn't accept. All the villagers including the villager leader didn't accept. It also happened in Katha where villagers didn't accept the explanation." (Ko Soe, beekeeper)

Next week, their beehives were destroyed by the local villagers. I felt sad for the beekeepers.

"This week, I've lost half of my beehives. Someone who own the garden close to my bee yards used weed and grass killer chemicals without my notice. Before that I was ready with enough bee population to start the honey production season. Now, I've lost everything." (Ko Chit, beekeeper, who lost beehives during my survey period)

"If one bee colony box is destroyed, we lost approximately 50,000 Kyats. In the past I was among those who lost beehives. Last year, my bee yard was not destroyed. But those of Zaw Khine, Ko Aung Kyaw Oo Lay, Aung Kyaw Oo Gyi and Zaw Htin were. There were 5 bee yards destroyed last year. They (local villagers) use various methods to destroy the bee colony boxes. They spray using insecticide, bet the box with something, lift up and crash down the box, burnt, various methods." (Ko Kyi, beekeeper)

"I keep my beehives near Kyukaw Village. All were destroyed last year. The village leader caught the villager who destroyed my beehives. I got 500,000 kyats in return from that villager as compensation. (The bee colonies destroyed costs 50,000 kyats per colony and there were about 100 colonies. It means he lost 5 million kyats and was compensated only 10 % of his loss.) But I just accepted because I don't want to face any problem with those local villagers later." (U Min Maung, beekeeper)

Local visitor's view towards beekeepers is rather negative.

First reason is related to reduction of crop production related to bees. Although bees help pollination and successful crop production, an overcrowded bee population can destroy the crops because overcrowded bees take all of the pollen

leaving no pollen for the process of pollination which is important in successful crop production.

> *"We grow crops every year. One year, a beekeeper arrived and kept his beehives near our agriculture farm. There were not many beehives. There was no problem at that year. Next year, many beekeepers arrived and our croups didn't success at all. In the successive years, they continue coming with many beehives and our crops are destroyed. Then we began to realize that our crops were not successful because of overcrowded bee population. When there was limited number of bees when the first beekeeper arrived, bees assisted pollination of flowers of and our crops were successful but in the successive years when the bee population was overcrowded, bees took all without leaving any pollen for the process of pollination. That's why our crops were destroyed. Now we don't accept any beekeeper to stay or keep their beehives near our village or near our agriculture farms. If they continue keeping their beehives near our farms, it is sure that their beehives will be destroyed." (U WA, villager and farmer)*
>
> *"Many villagers are complaining that bees destroy their crops." (Daw SY, villager and shop keeper)*
>
> *"People said that bees destroy their crops". (Daw KKL, villager and housewife)*
>
> *"Bees cause reduction of crop production. Previously, only one or two bee keeper works around our village and there was no problem. Starting 5 years ago, 4 or 5 beekeepers work around the village. Since then, there was significant reduction of crop production. The flowers were dried up earlier. I'm sure that it was not because of bad weather. It is caused by bees. When there were only one or two beekeepers, the bees were helping in crop production by assisting the process of pollination as you can read in the literature. But when the bee population was overcrowded, bees compete with other bees to get food, the pollen. Because the bees took all of the pollen leaving no pollen for pollination, the crops didn't success and the crop production was reduced. I had a debate on that topic with the agriculture officer and I'm quite strong from my side. I want to prove it by doing a research comparing the crop production at various bee populations." (U KT, village leader and farmer)*
>
> *"There is a big banyan tree near our village. In the past every year in winter, natural bees came, constructed more than 10 huge beehives in that tree and stayed the whole dry season. It reflects that there was sufficient food for them. Starting 3 years ago, the number of beehives in that tree reduced. This year, there was only two hives. It means there is very little food available for them because of the arrivals of apiculture bees." (U KT, village leader and farmer)*

> *"According to the farmers, the crop production has reduced because of the bees. They said that bees took all of the pollen and the crops were not successful." (Daw NN, villager and shop keeper)*

The second reason was the bees attack the local villagers. When a bee attacks an enemy, it inserts its poisonous sting (at the tip of its tail) into the enemy. It was a very painful experience and many people were scared to be attacked by a bee. The bees usually attack to protect their beehives. Anybody approaching a beehive is likely to be attacked. When the beehives are kept close to village roads, bees attack villagers travelling on the road.

> *"When the bees are kept near the village roads, the bees attack the villagers passing on the road and the villagers got angry. I don't like to be attacked by a bee." (Daw SY, villager and shop keeper)*
>
> *"Bees attacking on the villagers is a problem. No villager likes being attacked by bees." (U KT, village leader and farmer)*
>
> *"Bee keepers keep their beehives close to village roads and bees attack the people passing on the road". (Daw Nan New, villager and shop keeper)*
>
> *"People don't like when they were attacked by bees on the road they were using everyday." (Daw KKL, villager and housewife)*

Although the bee keepers organization and township organization issued local laws that prohibit keeping of beehives close to roads (within 100 feet), many of the beekeepers keep their beehives close to village roads.

> *"It was ordered by the township chairman not to keep beehives within 100 feet of village roads. But the beekeepers continue keeping their beehives close to the roads" (U KT, village leader and farmer)*

Beekeepers accepted that being attacked by a bee is not dangerous of people.

Figure 4.11 Writings on the wall of a camp describing bee poison is beneficial for people (The writing on the column says "bee sting makes healthy".)

> *"If bees get the smell, they will attack you. But you can just accept their attacking since bee poison is beneficial." (Aunty Lu, beekeeper)*

In fact, as they said, bee poison is good for health. It can be the rationale for many of the beekeepers to continue practicing keeping their beehives close to village roads where they can easily access their beehives.

Figure 4.12 Beehive boxes (Pyar Pone) placed close to a village road

4.5 Belief Systems and malaria experience

Most of the beekeepers suffered from malaria and some beekeepers witnessed their friends or relatives suffering from malaria. They can correctly explain about the sighs and symptoms that are characteristic of the malaria disease, i.e. typical intermittent fever which comes with three phases of cold, hot and sweating. Two of them did not know about malaria.

> *"I got fever. There was sensation of chill below the waist. It was just like "Sin Sin Sin Sin" and then there was chills and rigors followed by fever. Then the fever lowered." (Aunty Lu, beekeeper)*

> *"I got malaria when I was in Pakant. The fever was severe and I suffered a lot. I was treated in Myit Kyi Na. A blood test was also done. The fever recurs all the time. I even lost consciousness during malaria attack. I had a huge spleen. The spleen was so huge that its margin reached up to umbilicus. I didn't remember everything as I'd lost my consciousness. When I was discharged from the hospital, I realized that malaria parasite entered my brain." "There was sensation of tingling and numbness, and chills and rigor. It was followed by fever. The condition became worse with time. The body temperature was 105 (degree C) at the time of fever." (U Lay Maw, beekeeper)*

"Last year in October, I had malaria in "Hmaw" (= Jade production area in Pakant). There were chills and rigor, headache and body aches. After about one hour, there was sweating and the fever subsided. It happened for one week and I went to a clinic opened by a female doctor. Blood was taken from my fingertip. The blood test result the next day showed that there was "U Hnauk Poe" (a kind of malaria parasite that can even affect my brain, i.e. Plasmodium falciparum). I was given a kind of English medicine (western medicine). I had to take that medicine, 4 tablets each time, and two times a day for 6 days. The doctor told me to come back if it was not relieved. The drugs made me dizzy. I was recovered after taking the drug and I didn't go back to the clinic. There was no health education at the clinic." (Ko Si Thu, beekeeper)

"I got malaria first in 2005 when I was in Shwe Sar Yan. There was fever with chills and rigor. It lasted for 3-4 days." "It was in rainy season." (Ko Tun, beekeeper)

"I didn't have malaria. But I've experience with malaria because my friends got malaria. There was fever with chills and rigor. Later there was profuse sweating." (Myo Nyein, beekeeper)

"There were fifteen of us who got malaria. It was in 2008. We were staying in tent and working in pine forest near Lun Kyaw Village. Every staying there got malaria. We went to Kyein Ga Naing malaria clinic. We went there two times. The parasite was about to enter the brain of one of us. We went there to that Italian clinic (Italian NGO project clinic) because we don't have money. All of us have to check our blood for malaria. It was mandatory for everybody to take a blood test in that clinic. I got 'A the Hnget Phya Poe' (= liver malaria parasite = Plasmodium vivax) while my friends got 'U Hnauk Poe' (= brain parasite = Plasmodium falciparum). Fifteen out of fifteen beekeepers got malaria then. There is a volunteer in Lun Kyaw Village where we can consult free. But we went to the clinic in Lun Kyaw situated by the highway road. (He means Rural Health Sub-center. There is a midwife there.) After few days, we were out of money. So we were in Kyein Ga Naing FOC clinic." "The fever lasted for 12 days." (Ko Naing, beekeeper)

"I had malaria in 2011 when I was in my village, but was not serious. If there's fever today, there'll be no fever tomorrow. There was fever with chills and rigor. Sometimes it occurs every alternate day and sometimes daily. The fever usually comes at 12:00 noon and last only for one hour. It subsides before 1:00 pm. Appetite was good and my tongue likes sour taste. I could not speak at the time of febrile attack. Now I'm about to start a fever." "I have 8 siblings. I'm No. 5. All of my siblings suffered from malaria. My mother also got malaria. My father already passed away. Malaria is staying in our village." (Ko Cho, beekeeper)

4.5.1 Experience, knowledge and practice on malaria treatment methods

Most of them had the history of malaria. The treatment methods being used to treat malaria include self medication, herbal medicine, quack and basic health staffs. Some belief bee poison can cure malaria. Their health seeking behaviour for malaria reflects the health care systems being practiced. They rarely go to a medical doctor which can be due to scarcity of medical doctors in the rural area.

> *"I got malaria since ten years ago. It was in the forest and I was alone. I lost conscious while someone found me in the forest and carried to a 'Say Hmu' (= man who treat patients in th e village, either a quack or a health assistant) who treated me. After that I was cured." (Ko Chit, beekeeper)*
>
> *"Major Maung Maung Tin (Director General from Bee Enterprise) during his visit to Myit Kyi Na told that Bee can cure any 'Poe' (Poe = microbe) in the body." "If you enter into the world of apiculture, you can get malaria only in the early phase. Later, you'll not get malaria. In my opinion, bee poison is strong and concentrated. Once you got bee sting attack, the bee poison enters your blood vessel. Malaria parasite is also in the blood vessel. So the parasites die." "For malaria, I took artesunate and was not cured. Malaria was cured only after I worked in beekeeping business." (Aunty Lu, beekeeper)*
>
> *"My father prepared Sin-tone-ma-new (Guduchi or Tinospora cordifolia) for me. He cut it into pieces and dried up the pieces. Some of the dried pieces of Sin-tone-ma-new were mixed in boiled warm water. I've to drink it just like I drink green tea. The taste was very bitter. My spleen became smaller and smaller while I continued drinking it." (U Lay Maw, beekeeper)*
>
> *"After three to four days of fever, I treated with traditional herbal medicine, Sin-tone-ma-new. I'd to take that medicine three times a day with warm water. I took it for two days but fever was not relieved. So I received treatment from Kyan Mar Yay Hmu. He gave me injections and oral drugs for two days. (This term is confusing because many quacks named themselves as Kyan Mar Yay Hmu or Say Hmu and at the same time the official terminology for well trained health assistants serving for the department of health is also Kyan Mar Yay Hmu. In most of the villages, the term refers to quacks). I was relieved then." "I think once a person got malaria it cannot be eradicated." (Ko Tun, beekeeper)*
>
> *"I practice self medication if there is any health problem. I go to midwife if the problem is not solved." (Myo Nyein, beekeeper)*
>
> *"My mother prepared malaria drug herself. It is 'Beindaw Say' (= traditional medicine) although she is not a traditional medical doctor. She boiled some plants and roots and the soup is used as anti-malaria. Drinking that soup prevents malaria. Mother gave me two litres of that*

soup which I gave to friends in Madaya. My 'Dway Lay' (= paternal uncle who is younger brother of father) also knows how to prepare malaria drug. It is our family remedy used by our ancestors. 'Ah May Gyi' (grandmother) also prepare that medicine but only for those villagers who got sick. (not as a business). I always forgot to ask that remedy from mother." (Ko Naing, beekeeper)

"I went to Moe Tar for malaria. I received injections there. It is a private clinic and there is a medical doctor called Zaw Min Htay. There my blood was tested with an instrument and it took about 15 minutes for the result. The results were positive everytime I was tested for malaria. I was given injections and oral medicines for three days. I also took herbal medicines at the village made from boiling of roots of herbal plants called 'Pan Thone Sin'. I also ate the meat of black dog and took mixture of alcohol and uncooked fish paste 'Ngapi'. Now I'm cured from malaria and I didn't recognize which medicine cured my disease." (Ko Cho, beekeeper)

4.5.2 Belief in malaria prevention

Malaria prevention was based on their belief on the causation of malaria. The preventive factors/methods mentioned include bee poison, boiling of water or avoiding of water from the forest/streams which is believed to be not clean and containing pathogens, sleeping with bed net, wearing warm clothes, drinking herbal tea, avoiding foods that cause malaria, covering of drinking water, etc.

"If you enter into the world of apiculture, you can get malaria only in the early phase. Later, you'll not get malaria. In my opinion, bee poison is strong. Once you got bee sting attack, the bee poison enters your blood vessel. Malaria parasite is also in the blood vessel. So the parasites die." "To prevent malaria, you must drink clean water. You must filter the water before drinking. Don't drink the water which is not clean. Another thing is when you are in the forest, you cannot stay as if you are in the city. Sleep with bed net." (Aunty Lu, beekeeper)

"In the past I got malaria. Malaria was cured when I started working in apiculture business." "The Sin-tone-ma-nwe green tea can be drink for the prevention of malaria." "You must drink boiled water, wear warm clothes, and sleep with bed net." (U Lay Maw, beekeeper)

"Malaria can be prevention by preventing mosquito bite and by avoiding foods that cause malaria such as bamboo shoot, sour (fermented) and spicy foods." (Ko Si Thu, beekeeper)

"Malaria can be prevented. You must sleep with bed net and prevent yourself from mosquito bite. You must not drink San Yay. You must not eat banana." (Ko Tun, beekeeper)

"To be able to prevent malaria, you must clean the dish and you must make sure your Yay Oe (earthen pot used as water container) is securely

covered (so that mosquitoes cannot lay eggs). (confused between DHF and malaria.)" (Myo Nyein, beekeeper)

Two of the interviewed beekeepers experienced malaria health education programme one year ago while others never seen, heard or read about malaria.

"Nobody in the clinic talked on malaria health education (because of work load/many patients)." "Last year I saw a health education programme in Kyat Tat Village in Pyin Oo Lwin. I read a pamphlet but it was not into detail and was not so informative." (Ko Naing, beekeeper)

"Every year, a health education team visits my village. I don't know from where they came." Last year, health department came to the village and made education. I didn't go there. My mother went to that place. It is the responsibility of elderly persons to go to such kind of place. When she came back, she told about personal hygiene practice and to use bed net." (Ko Cho, beekeeper)

4.5.3 Malaria perception and beliefs

There were differences in malaria awareness between different beekeepers. Some know that malaria is fatal while some belief it is not fatal.

"Malaria is a dangerous disease because it can cause loss of consciousness and vomiting of blood as I've seen in 'Hmaw'. I've never seen anyone die from malaria." (Ko Si Thu, beekeeper)

"Malaria can be dangerous. If the parasite enters into brain, it can cause death or bad brain." (Ko Tun, beekeeper)

When they move to an area without malaria and without malaria awareness, there was the possibility of stigmatization.

"Some people said that the malaria is a disease of lazy people. Because it comes at regularly time intervals and they think that that person who got malaria is just pretending and is not a real fever. He's pretending because he doesn't want to go to work. And he's quite a normal person after an hour of febrile attack." (Ko Cho, beekeeper)

4.5.4 Experience, perception on bed nets and ITN

Three among the beekeepers did not use any bed net. Their reasons include bed nets are hot, not free and are not important in daily life.

"It is good for health if I can sleep with bed net. But it is very hot inside a bed net. It is so hot even if I don't stay inside a bed net. So I don't want to

use bed net. Even if the weather is cold, I'd like to cover my body with blanket. Bed net traps the body." (Ko Naing, beekeeper)

"I don't sleep with bed net. I just cove my body with a blanket. Whether it is hot or cold, I'd like to use blanket to cover my whole body if I sleep. Although I used bed net when I was a child, I don't use bed net when I grown up. Bed net is not important in daily life." (Ko Soe, beekeeper)

"I don't sleep with bed net not only in Nawnghkio but also in my village. I like the freedom of my body. Inside a bed net, I feel that I'm trapped and it's not feeling free." "Bed net makes me hot, choked and dizzy. So I never take it out from my luggage. Mother bought me that bed net." (Ko Cho, beekeeper)

Other beekeepers use ordinary bed nets and nobody uses ITN. Most of them were sleeping under bed nets because they were used to sleeping with an ordinary bed net and the purpose was not for malaria prevention. The following lady did not belief that sleeping under a bed net can prevent malaria.

"I always sleep with bed net since I was a child. But since I was going everywhere, bed net cannot prevent me from malaria. I got malaria although I always sleep with bed net. But you will suffer more if you don't sleep with net." "I think sleeping with bed net is good. It makes me feel safe." (Aunty Lu, beekeeper)

Some of them mentioned bed net as part of their daily life. In contrast to the beekeeper mentioned above, they have the emotion of freedom once inside a bed net.

"I sleep with bed net. The mind is free when I sleep inside a bed net. But I don't sleep with ITN. I don't have ITN either." (Ko Chit, beekeeper)

Bed nets not only protect from the mosquito bite, but also from other insects and dust particles. Nets also provide privacy while sleeping.

"I used bed net since I was a young boy." "I bought a bed net and using it now. I don't use insecticide to impregnate my bed net." "Bed nets can prevent from the dangers caused by mosquitoes. A bed net can also protect the person sleeping with it from bites of other insects and also from dust particles falling into the face during sleep. It can also protect the body parts while sleeping." (Ko La Maw Naw, beekeeper)

Some do not like bed net because it is hot inside. The decision to sleep under a bed was made because of bite nuisance. Bed nets are helps for a good sleep.

"Previously I didn't use bed net because it is very hot inside a bed net. I just started using it because of the mosquitoes which disturbed with my sleep. Bed nets are good in that they can make people enjoy their sleep well. I don't know about ITN and I don't have any." (Ko Thet, beekeeper)

Bed nets also protect against the cold weather during the cold season/environment.

"In Myit Kyi Na, I don't sleep with bed net. But in other places, I sleep with bed net. I started using bed net only when I first arrived in Nawnghkio. I bought the bed net. I don't use ITN although I've heard about it. Bed nets not only prevent from mosquito bite they make the person inside warm during the winter. But I don't want to use it in summer, it is very hot." (Ko Tun, beekeeper)

"I slept with bed net since birth. I bought bed net I'm using. I don't know about ITN. I've never heard of it before. I've no idea on ITN." (Ko Si Thu, beekeeper)

This lady was surprised to learn about use of insecticide treated bed net. She was among those who did not have any knowledge about ITN.

"What? Did you say bed net is impregnated with insecticide?" "I've not idea with that. I've never heard about that". It is a strange idea to impregnate bed nets. But I don't need insecticide." (Aunty Lu, beekeeper)

For those who heard about ITNs, an ITN is not a superior entity compared to an ordinary bed net.

"I've never used ITN. It might be good but there is no difference compared to an ordinary bed net. An ordinary bed net can also prevent mosquito. (It is putting burden by adding extra work to use insecticide.)" (Ko Naing, beekeeper)

"I don't have any knowledge on ITN and seen an ITN. In my native I once received a tablet to impregnate but I didn't use it. I didn't receive any such tablet as a beekeeper." (Ko Soe, beekeeper)

"Once I received an ITN when I was in the village but I gave it to my mother. The mosquitoes can also be found near an ITN. (He meant the ITN effectiveness is not different from that of ordinary bed net)" (Ko Cho, beekeeper)

4.6 Health care delivery system related to malaria control programme

4.6.1 Government health care system for malaria

Three government hospitals and 25 rural health centers are providing malaria treatment and prevention services for Nawnghkio Township. For the rural areas, the mid-wives are taking the responsibility for the government malaria project.

> *"For the government malaria project, there were mid-wives and health assistances implementing at the grass-root level rural and station health centers who were supervised by a malaria supervisor, township health assistant, medical doctors and township medical officer. Laboratory technicians from the township hospital also check malaria blood slides if requested." (Dr X, INGO)*

There was less material support for the government staffs. The diagnostic material, the malaria rapid diagnostic test kits (RDTs) are limited and are distributed to mid-wives with a quota. The antimalarial drugs supplied were also limited for midwives.

> *"Midwives have limited quota of RDTs and antimalaria drugs. So the use of RDTs and drugs is also limited. They cannot handle so many malaria patients." (Dr X, INGO)*

The government side cannot spend much for prevention especially the budget for LLINs is limited.

> *"Although midwives are implementing the malaria project, they did not have supply of LLINs to distribute to the community for prevention of malaria." (Dr X, INGO)*

The midwives were also overloaded with many projects of the Department of Health. One midwife was found to be responsible for 17 projects in her area. Overloaded basic health staffs cannot emphasize and give effort only on malaria. They have many other projects.

> *"One midwife is taking the responsibility to implement so many projects of the Department of Health for her area. A midwife made the list of the projects she was implementing. There were 17 projects. She cannot prioritize and give effort to a single project such as malaria project. She has to pay attention to all the projects." (Dr X, INGO)*

The midwives were also struggling for the survival because of the low salary. So there was less concentration on their work.

> *"The salary of a midwife is 80,000 kyats. It'll be difficult for a midwife with a family to survive relying on that amount of salary. So she also has to try to earn money for the survival. Some midwives open private clinics at home. Some midwives do other kinds of businesses."*

The vector born disease control (VBDC) team for the area was not functional.

> *"There is a VBDC team in Nawnghkio. The team is not so active. I haven't seen any activity while I worked here. The staffs are not well motivated. Some of the health staffs also complained that one of the VBDC team members was always drunk." (Dr X, INGO)*

To reinforce the government malaria control activities, non-profit organizations co-operated with the government department of health in the area and implemented malaria control projects.

4.6.2 Community-based malaria prevention and control project

A malaria project has been started by an INGO since 2007 until 2011 funded by the 3 Diseases Fund. In Nawnghkio township 120 villagers were covered by the INGO project while all other villages were covered by the department of health using the same funding. The project continued with the funding from Global Fund after 2011 and will implement for a total of five years. In the 3 Diseases Fund projects implemented by the government department of health and that of the INGO were slightly different.

> *"For the INGO project, there is a malaria project doctor, a nurse, a malaria microscopist and a team assistant. The project opened weekly fixed malaria free of charge clinics in 3 locations. A mobile clinic was also opened by the same staffs which go around the project villages which are situated around the central valley as well as in the mountainous areas. The project trained local volunteer villagers for malaria diagnosis, malaria treatment, bed net impregnation methods and malaria health education. Trained volunteers or village health workers (VHWs) are provided with malaria rapid diagnostic kids (RDTs) and malaria drugs. They stay in their own villages and perform blood malaria testing for every fever patients and everyone who wants to check for the presence of malaria*

parasite in their blood especially when they come are coming back from other malarious areas. The VHWs also keep records of patients, population, bed net ownership and impregnation. The project provides free diagnosis and treatment service to everyone, including the migrants and travelers, who attended the fixed and mobile clinics. But the preventive activities, i.e. insecticide impregnation of pre-existing bed nets and free distributing of ITNs, are limited only for the villagers staying in the project villages. Since the health education sessions are accompanied to impregnation and ITN distribution campaigns, the health education activities seemed to be automatically limited to the project villages." (Dr X, INGO)

4.6.3 Malaria situation

With the start of the malaria project in the township, the idea of villagers regarding malaria has changed. Now local villagers accept that malaria is caused by malaria parasite and is transmitted through mosquito bite. Malaria prevention using ITN, and consulting VHWs or malaria clinics becomes common practice.

After implementation of the 3 Disease Funded project "Community based malaria prevention and control project", the trend of malaria in local villages is decreasing (Lin, 2011).

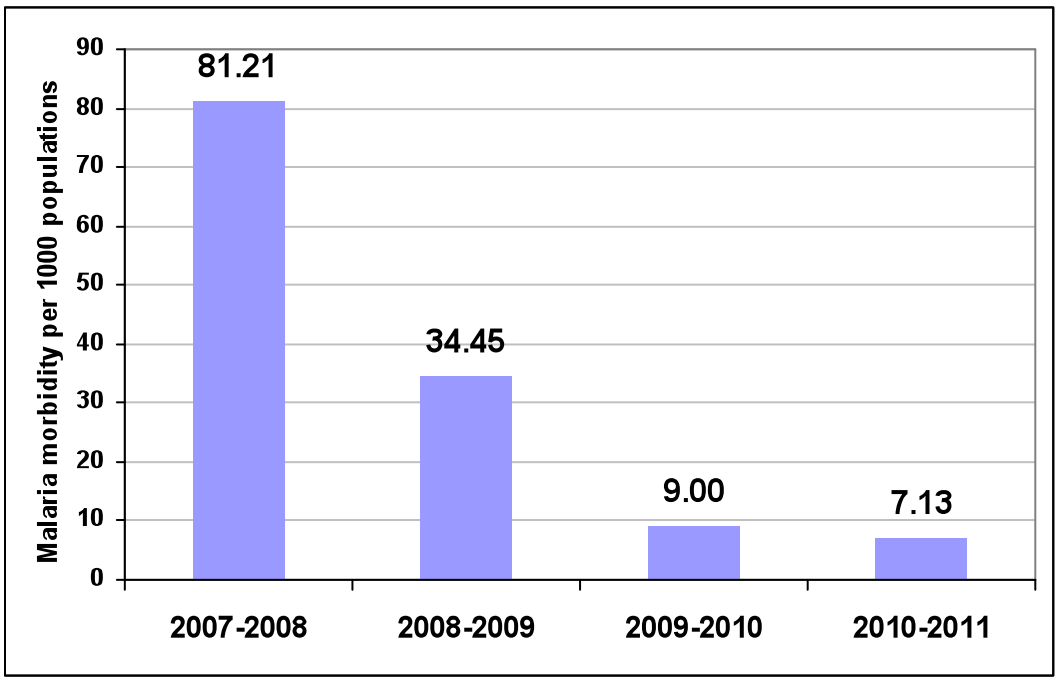

Figure 4.13 Malaria Morbidity (cases per 1000 populations) of 60 Selected Villages in Nawnghkio Township from 2007 to 2011 (Lin, 2011)

"To give a comment of the malaria trend, it is needed to compare the morbidity data year by year. Malaria morbidity is calculated based on the number of cases of a particular place in a particular year and total mid year population of that place. It is not possible to calculate the malaria morbidity of the beekeepers since their population is changing with seasons. But the number of beekeepers who consulted the basic health staffs and the volunteers is almost the same each year." (Dr X, INGO)

"Beekeepers keep coming to me even though the project in this village has stopped at the end of December last year (2011). Even yesterday, a beekeeper came to me for fever. His blood was tested for malaria and the test result showed positive for Plasmodium vivax. So I gave him chloroquine and primaquine." (AZS, INGO)

4.6.4 Beekeepers' perception on health care providers

If possible, beekeepers prioritize to consult a paid health staff. The free of charge health care providers are their last choice. (They try to show up themselves among the local villagers that they have money by going to paid clinic.)

"We went to Kyein Ga Naing malaria clinic. We went to that Italian clinic (Italian NGO project clinic) because we don't have money." "There is a volunteer's house in Lun Kyaw Village where we can consult free. But we went to the clinic in Lun Kyaw situated by the highway road. (He means Rural Health Sub-center. There is a midwife there. They had to pay for treatment there.) After a few days, we run out of money. So we were in Kyein Ga Naing FOC clinic. In fact, I was in debt at that time for I had to borrow money to buy drug from the midwife." "The fever lasted for twelve days. I went to the clinic twice. After that I run out of money so I stay in the tent for few days. I could not eat or drink. There was pain in my throat. I became sick and vomit if I walk a few steps. Then I was bed bound. My friends brought me to the free of charge clinic. I thought I was dead. I received two injections in my buttock. I went to FOC clinic three times. My blood was examined in the first visit. There was 'Athe Hnet Phya Poe' in my blood and I was given drugs. In the later visits there were no more parasites in my blood." "Nobody explain about malaria in the clinic. There was a long queue of patients. The clinic didn't impregnate our bed nets." "Ko Myo Chit went to Mandalay (expensive). Others went to Wet Wun (Station) Hospital (less expensive than going to Mandalay). Some went to Kyein Ga Naing together with me (free of charge)." "I heard about other diseases on the radio but I've never heard about malaria." (Ko Naing, beekeeper)

"Nurses in Katha hospital are good in terms of communication and serving the patient. In Mandalay, 'Saya's always shout at the patients. In Lun Kyaw clinic, there's less patient and in most of the time, the clinic is closed. Italy clinic is also good as Katha hospital. I tried to give money and nobody took. When I brought food for them as present, they didn't

accept and said that I should eat myself to build up my strength." (Ko Naing, beekeeper)

"When I got heat exhaustion and lost fluids from my body and dehydrated, a quack gave me two injections at my buttock. I had injection abscesses at both buttocks because of the quack. I suffered from the abscess that I could not walk normally and my back was twisted. I received an operation for those abscesses. After that I don't believe anyone who gives injections." (Ko Soe, beekeeper)

4.6.5 Project staffs' perception on beekeepers

Was it discrimination? Was it monopoly?

"According to the information from the chairman of the township, there were approximately 120 beekeepers staying in the township. I knew they were important since they were migrants and were important for malaria transmission. But the number of beekeepers was only 120 and they are in fact scattered among the villages. So that number was not important statistically and can be neglected." (Dr X, INGO)

"There are many malaria patients among the beekeepers in this township. Many of those patients attended the malaria clinics, mid-wives and volunteers to receive treatment. In the villages the malaria burden has reduced to an extent that in some villages, the malaria seems to be eliminated since two years ago. But the beekeepers are still suffering from malaria. Last week, a migrant beekeeper came to me for malaria blood testing. He was positive for malaria and I gave him anti-malarial drugs." (AZS, INGO staff)

"If a beekeeper arrived at the clinic with the complaint of fever, it's almost sure that the blood test will show malaria parasite and was always true. If there were many patients, I could not give any health education. But I tried to give malaria health education whenever a patient was found to have malaria." "Although I gave health education to beekeepers whenever feasible, I never mentioned that the project provides LLINs free of charge. The beekeepers were not in the criteria and so I could not give them. So it is better to stay quiet on that topic." (Dr X, medical doctor, INGO)

4.6.6 ITN ownership among the bee keepers

Nobody among the beekeepers owned an ITN at the time of survey period.

"What? Did you say bed net is impregnated with insecticide?" "I've not idea with that. I've never heard about that". "It is a strange idea to impregnate bed nets. But I don't need insecticide." (Aunty Lu, beekeeper, said in surprise)

"I don't sleep with ITN. I don't have ITN either." (Ko Chit, beekeeper)

"I don't know about ITN and I don't have any." (Ko Thet, beekeeper)

"I got a 'Say Sein Chin Htaung' (= LLIN) when I was in Mezar. The colour was blue and was a big one. But I didn't take it. I gave it to a friend there. But I didn't get any in Lun Kyaw in Nawnghkio. I've never used ITN." "When there was ITN campaign in Kyein Ga Naing nobody invited as because we are the strangers. But for the local villagers, they can get ITN even if they didn't go to the campaign place. The staffs follow their house and gave the ITN." (Ko Naing, beekeeper)

"We didn't give any ITN to bee keepers." (Ma SSU, nurse, INGO)

"I didn't invite any bee keeper for ITN free distribution campaigns or bed net impregnation campaigns." (U MW, village leader and farmer)

"We made the list of villagers to receive bed nets before we start an ITN campaign. The main criterion to be in the list is to be a local villager. Beekeepers are not the local villagers." (TDA, VHW)

4.6.7 ITN ownership among the local villagers

ITN ownership is high among the village households of the project villages. Although there is no ITN census data, the project records and surveyed data with the local villagers indicated that there is full ITN coverage for all the project villages.

"The project targeted ITN coverage of 1 ITN/household initially and later the target was increased to 2 ITNs/household." (Dr Z, Country Coordinator, INGO)

"We haven't conduct ITN census yet. But I'm sure that the project already achieved its target coverage of ITN which was as least two LLINs per household." (Dr X, medical doctor, INGO)

"I have enough ITNs for my family. All of my neighbours also have enough ITNs which they received from the malaria project." (U WA, local villager and farmer)

"All of the households in my village have enough ITNs and I believe that everyone in my village is sleeping under ITN although I cannot check every household." (U KT, village leader and farmer)

4.6.8 Reasons for poor ITN ownership among beekeepers

The difference in ITN ownership status among local villagers and beekeepers has many reasons behind.

4.6.8.1 Insufficient ITN in the project: ITN distribution criteria of the project

When the 3DF project started, the government side could not distribute ITNs to the villagers. It was the INGO side which distributed LLINs free of charge to the people staying in the project area. The funding was limited at the start of the project and so the criteria were set for the distribution of LLINs. Only those who met the criteria were supplied with LLINs.

> *"For the first year of the project, there was limited number of LLINs. It was not possible to give LLIN to each and every household in a village in the project area. So that the criteria were set and the people were screened according to that criteria. One of the criteria was that the one must be a local villager who will not move to other place after receiving the LLIN given by the project. So it was entirely not possible to include the beekeepers." (Dr X, medical doctor, INGO)*

4.6.8.2 Sufficient ITN but beekeepers still are not in the criteria

In the successive years, there was more funding and more LLINs were in the stock. More and more villages had been covered by the project. But, migrants including bee keepers are not included in the criteria for the free distribution of ITN.

> *"The Italian malaria project distributes ITNs to the local villagers but I didn't go there. Nobody invited me." (Ko Naing, bee keeper)*
>
> *"I didn't invite the bee keepers because nobody from the malaria project asked me to invite them". (U KT, village leader and farmer)*
>
> *"According to the criteria of the project, the bee keepers are migrants and are not illegible to distribute bed nets." (Ko AZS, former malaria project team assistant)*

4.6.8.3 Beekeepers cannot be believed and are difficult to control

It was suspected that the bee keepers and other migrants, being regarded as uncontrollable group of population, ITNs might have been sold in the market or might have been used as 'Apaung Pyit See' in 'Apaung Saing' to 'Apaung Khan'.

> *"The project asked me to take the responsibility of ITNs being distributed. I took the responsibility for ITNs given to my villagers. But I could not take*

the responsibility for those given to migrants. I don't have any authority to control them." (U MW, village leader and farmer)

"One reason the migrants including bee keepers are not included in the criteria is that the project calculates ITN coverage on the basic of population sizes. It is difficult to calculate the mobile and migrant population size since they are moving in and moving out all the time". (Dr Z, Country Coordinator, INGO)

"My friends saw shops in Mandalay Zaygyo market selling ITNs, which are supposed to be distributed by some INGOs in some particular project areas. The possibility is that the beneficiaries or the person who received the ITNs sold it back into shop. Another possibility is the misuse by INGO staffs." (Dr Y, Field Coordinator, INGO)

4.6.8.4 Prioritization for donors and funding availability

The first priority of the organization which implemented the malaria project was to get funding from the donor and to make the profit.

"One of the project staffs saw a man who's trying to keep his LLIN in 'Apaung Saing' to borrow money. If the donors knew, the future of our organization will not be good. The event was reported to the country director. The criteria set for the distribution of LLIN to the project aimed to control such events." (Dr X, INGO)

"There is a worry from the INGO that if the donors know that someone is selling the LLINs from this project in the market, this organization would be black listed and further funding will not be available from that donor. It is important to make sure that someone is taking the responsibility that the LLINs would not be sold out. The village leaders took the responsibility for the local villagers. There is no one who can take the responsibility for the bee keepers." (Dr Y, INGO)

"No funding means no profit for them (Italians). There will be no pocket money for them if that happens. ... ... There is no transparency especially with the project budget. They don't let the local staffs of Myanmar know the budget. The foreigners working for this organization are all Italians. Most of them are not properly qualified and are not experienced for their highest salary positions of this organization in Myannmar. If they stay in Italy, they all will be jobless. Although they lack the capacity and ability, they got those high positions in this organization because they are Italians. Because of their low capacity, low education background and lack of experience, they don't wish local professional staffs know their salaries. If the local staffs realize their high salaries, they definitely will complaint to the organization and to the donors. They even didn't take out their salaries inside Myanmar. They take out their salaries only when they are back in their own country. Apart from the high salaries for distinguished Italians, the budget misuse is another problem of this organization. They are scared that anyone from Myanmar would know

their budget. Why? It is clear that they are stealing the donor's money in many indirect ways, which is intended for the community. Only approximately less than 50 % of the donor's money goes to the beneficiary population. In the first two years of this malaria project, 35 % of project money was spent for the salary of two Italians. Later, they kept their budget details a top secret. I was holding the highest position among Myanmar employers of that organization. In spite of my high position, I was not allowed to check the project budget. Italian government, although they are donors to non-profit organizations in Myanmar, will also encourage that kind of budget policy because it is good for them: 1. beneficial to its Italian citizens (the Italians get good salary jobs), 2. unemployment problem in their country is partly solved, 3. better political image (from the view of their citizens and from the view point of other countries, they are very nice because they are donating to other countries but in reality a high percentage of their donation goes back into their own country)" (Dr Z, INGO)

4.6.8.5 Migrants are not legal in the area

Most of the villages use ID card numbers and registration forms whey they make the list of people to receive ITN before ITN campaigns. Since the bee keepers are not from the area and are not registered locally, they are excluded from the list.

"Bee keepers are not in the list of this village. We make the list for ITN campaign according to the legal status. So they are not included". (U KT, village leader)

4.6.8.6 Migrants are not part of the local community

Bee keepers form a community themselves more or less separated from the local community for various reasons. During the participant observation period, I saw no local villager visiting their camps and vice versa as a daily routine. Even when the local people are celebrating some kind of annual religious festivals, bee keepers did not participate. But they made frequent visits to other bee keepers staying in other places.

"We don't visit them and they don't visit us. I can remember nobody, no villager visited our camp." (Ko Naing, bee keeper)

"The villagers are from Shan ethnic group. It is difficult to understand them." (Ko Min, bee keeper)

"The villagers think that our bees destroy their crops. Actually they are totally wrong. Some of the villagers destroyed our bee boxes." (Ko Naing, bee keeper)

"It is true that their bees destroy the crops. If the number of bee colonies is less, it is beneficial for the crops because bees assist in the process of pollination. But when there are many colonies, the number of bee population density is high that bees compete each other in order to get the food (pollen and nectar). With many bees, all of the pollen would be taken and there will be no pollen to complete the process of pollination. So, small number of bees is helpful to us while large number of bees is dangerous for us." (U KT, village leader)

"Bees attack the villagers. It is no wonder that villagers don't like bee keepers." (Daw San Yee, Villager)

4.6.8.7 ITN or LLIN is not available otherwise (not easy to buy)

There was the possibility that bee keepers can buy ITNs if ITNs were available in the local market. But no shop was selling any ITN because no villager wanted to buy ITN after the malaria project made free distribution of a lot of ITNs to the local community. So it is not possible for the bee keepers even if they want to buy it.

"There is no shop selling ITN. It will be good if shops can sell ITN. Actually, ITN price is not expensive compared to ordinary bed nets. But when the project distributed LLINs free of charge, it was not necessary for a local villager to buy an ITN. Subsequently, there's no market demand. I'm not surprised nobody's selling any ITN in the market." (Dr X, medical doctor, INGO)

"The shops don't sell any ITN or LLIN. They'll sell it if there're customers. Malaria project gave LLINs free of charge to all the villagers. Since nobody is buying the ITN, none of the shops wants to sell it." (Daw Nan New, villager)

4.6.8.8 Poor ITN knowledge, attitude and practice of beekeepers

There are beekeepers who never heard about ITN or never seen ITN before

"What? Did you say bed net is impregnated with insecticide?" "I've not idea with that. I've never heard about that". It is a strange idea to impregnate bed nets. But I don't need insecticide." (Aunty Lu, beekeeper)

"I don't know about ITN and I don't have any." (Ko Thet, beekeeper)

"I don't know about ITN. I've never heard of it before. I've no idea on ITN." (Ko Si Thu, beekeeper)

Some of the beekeepers heard about ITN but they are not using it.

"I sleep with bed net. The mind is free when I sleep inside a bed net. But I don't sleep with ITN. I don't have ITN either although I heard about ITN some years ago." (Ko Chit, beekeeper)

"I bought a bed net and using it now. I don't use insecticide to impregnate my bed net." (Ko La Maw Naw, beekeeper)

"I don't use ITN although I've heard about it." (Ko Tun, beekeeper)

"I've never used ITN. It might be good but there is no difference compared to an ordinary bed net. An ordinary bed net can also prevent mosquito. (It is putting burden by adding extra work to use insecticide.)" (Ko Naing, beekeeper)

"I don't have any knowledge on ITN and seen an ITN. In my native I once received a tablet to impregnate but I didn't use it. I didn't receive any such tablet as a beekeeper." (Ko Soe, beekeeper)

"Once I received an ITN when I was in the village but I gave it to my mother. The mosquitoes can also be found near an ITN. (He meant the ITN effectiveness is not different from that of ordinary bed net)" (Ko Cho, beekeeper)

4.7 Belief system of migrant beekeepers that influence ITN usage

4.7.1 ITN preference and ITN usage potential among the beekeepers

It is difficult to conclude that they don't use ITN because they don't have it. Is there any possibility that the bee keepers might be using ITN if they have? According to the indepth-interviews conducted, there is less potential of using ITN among bee keepers.

"Since I married to a local villager lady, she received an ITN from the malaria project but I didn't use it at all. I gave it to someone and now I don't have any ITN in my house." (U Lay San, bee keeper)

"My wife is a local villager. She received an ITN last year. But we gave it to someone." (Ko Min, bee keeper)

"Once I received an ITN when I was in the village but I gave it to my mother. The mosquitoes can also be found near an ITN. (He meant the ITN effectiveness is not different from that of ordinary bed net)" (Ko Cho, beekeeper)

"Most of the time, I sleep without any bed net. I think ITN would be too much. I don't need it." (Ko Naing, bee keeper)

4.7.2 Belief on cause of malaria

Causes of malaria believed by the beekeepers included drinking of unclean water, mosquito bite, eating of some food, cold weather and person to person contact. So it was not logical for them to accept the use bed net as the only thing for the prevention of malaria. To prevent from malaria, it needed combination of other measures such as drinking boiled or purified water, avoiding of foods that cause malaria and making the body warm in cold weathers.

"Boiled water is available only if there is any shop selling boiled water. So there was malaria." "I think malaria is caused by mosquito bite and drinking water which is not clean." "When I said "water which is not clean", I mean the water which is from the forest, from the ponds or from the river/stream. Sleeping without bed net is also risky. Many people who work in gold production industry got malaria since they are working in the river water and they will drink that water." (Aunty Lu, beekeeper)

"Malaria is caused by drinking the water from the stream without boiling. It is also caused by cold weather and mosquito bite". (U Lay Maw, beekeeper)

"There are two causes. First is mosquito bite. Second cause is eating bamboo shoot. It was my own experience as well as the experience of my friends that malaria is caused by eating bamboo shoot." (Ko Si Thu, beekeeper)

"I saw a pamphlet that malaria is caused by mosquito. But some said that it is caused by drinking water from the stream/river. Some said it is caused by eating banana. People from Shwe Sar Yan Village told me that there are malaria parasites in the 'San Yay' (water from the stream) and in banana." (Ko Tun, beekeeper)

"Malaria is caused by mosquito. I heard it from a health talk in my own village. (Not here.) Government health staffs organized that talk. They also gave booklets on malaria." (Myo Nyein, beekeeper)

"Malaria is caused by nature. I heard it from others. I cannot remember where and who said. It is caused by water and life style. In the pine forest, there are a lot of mosquitoes, especially in the evening. You cannot sit in the evening because of mosquito bite. At night you cannot sleep without bed net or blanket. Another thing is water. In Kyein Ga Naing, there is a

spring. We use water from that spring. The water is 'Thit Ywat Poat Yay' (= water of rotten leaves). I've heard that mosquito lays eggs in that kind of water because mosquitoes like rotten things. If someone drinks without boiling it, he'll swallow the mosquito eggs. There are malaria parasites in those eggs. I heard it from elderly people from Htee Chaink while I was with them in the forest to cut bamboos. They call that kind of water as 'Phet Swut Yay' (= water that wash leaves). If you drink that water, you'll get malaria. You cannot get malaria by washing your face and limbs or bathing using that water. After I heard about that, I drink water only after it is boiled. The parasites in water die after boiling." "I don't eat fruits such as mango, jack fruit, papaya while I stay on the mountain. These fruits are called as 'Ah Aye Sar' (= cold food). The mosquitoes bite these fruits, and they ripe earlier. Malaria is also caused by eating these fruits. My mother told me that." (Ko Naing, beekeeper)

"Whether a person got malaria or not depends on the life style, food, drink and water." "It depends on land and water. In Myo Hla, the small river has dirty water and so there is malaria." "Elderly people from my village told me that 'Thit Poat Yay' (= water of rotten tree) can cause malaria. Mosquitoes lay eggs in Thit Poat Yay. (Ko Soe, beekeeper)

"Malaria is caused by drinking water which is not clean and by mosquito bite. I heard it from the elderly people from my village. The water from the pond which contain 'Nwe Shin' (= small living vine) is malarious. Anyone who drinks that kind of water gets malaria." "I worked for a road construction project in Myo Hla where I collected marble stones from the bank of Kauk Kwe River which is notorious for its Phet Poke Yay which doesn't mix the water in Ayeyarwady River. I drank that water while I was collecting marble stones." (Ko Cho, beekeeper)

"Malaria is transmitted from person to person contact. ... It a malaria patient visits my place and if he sit close to me during his visit, I'll be infected." "I don't know what kind of disease it is. It is just like being cursed by someone." (Ko Myat Min, beekeeper)

4.7.3 Belief that malaria is treatable and prevention is not important

According to their own experiences and experience of seeing close people, they didn't think that malaria prevention is important because it can be treated easily by various methods.

"I got malaria since ten years ago. It was in the forest and I was alone. I lost conscious while someone found me in the forest and carried to a 'Say Hmu' (= man who treat patients in th e village, either a quack or a health assistant) who treated me. After that I was cured." (Ko Chit)

"Malaria was cured after I worked in beekeeping business." (Aunty Lu)

"My father prepared Sin-tone-ma-new (Guduchi or Tinospora cordifolia) for me. He cut it into pieces and dried up the pieces. Some of the dried

pieces of Sin-tone-ma-new were mixed in boiled warm water. I've to drink it just like I drink green tea. The taste was very bitter. My spleen became smaller and smaller while I continued drinking it. Finally, I was cured of malaria." (U Lay Maw)

"I received treatment from Kyan Mar Yay Hmu. He gave me injections and oral drugs for two days. (This term is confusing because many quacks named themselves as Kyan Mar Yay Hmu or Say Hmu and at the same time the official terminology for well trained health assistants serving for the department of health is also Kyan Mar Yay Hmu. In most of the villages, the term refers to quacks). I was relieved then." (Ko Tun)

"I practice self medication if there is any health problem. I go to midwife if the problem is not solved. (His face shows that malaria is not a big problem to handle.)" (Myo Nyein)

"My mother prepared malaria drug herself. It is 'Beindaw Say' (= traditional medicine) although she is not a traditional medical doctor. She boiled some plants and roots and the soup is used as anti-malaria. Drinking that soup prevents malaria." (Ko Naing)

"Malaria is not a priority. All the health problems have the same rank in terms of priority." "If I got fever, I don't use English medicine. I've my own medicine remedy from my 'Dway Lan' (uncle). Ginger (5 tickles), beetle leaf (3 tickles), some palm sugar (for sweetness), 'Lay Nyin Pwint' (5 flowers) are boiled in water until only one-third of water is remained. I drink one small cup every morning. It can prevent any kind of fever including malaria. My uncle had no fever as far as I know. The taste is bitter. My uncle takes it regularly. My grandpa also took that medicine and he lived until 99 years with all of his teeth intact." (Ko Naing)

"I went to Moe Tar for malaria. I received injections there. It is a private clinic and there is a medical doctor called Zaw Min Htay. There my blood was tested with an instrument and it took about 15 minutes for the result. The results were positive everytime I was tested for malaria. I was given injections and oral medicines for three days. I also took herbal medicines at the village made from boiling of roots of herbal plants called 'Pan Thone Sin'. I also ate the meat of black dog and took mixture of alcohol and uncooked fish paste 'Ngapi'. Now I'm cured from malaria and I didn't recognize which medicine cured my disease." (Ko Cho)

4.7.4 Belief that the mosquito alone is not important in causing malaria

There are other causes contributing to malaria in addition to mosquito. So mosquito alone is not an important cause of malaria disease. With that reason, bed net or ITN is not important in preventing malaria. To be able to prevent malaria, it needs to consider other cause of malaria.

"If you enter into the world of apiculture, you can get malaria only in the early phase. Later, you'll not get malaria. In my opinion, bee poison is strong. Once you got bee sting attack, the bee poison enters your blood vessel. Malaria parasite is also in the blood vessel. So the parasites die." "To prevent malaria, you must drink clean water. You must filter the water before drinking. Don't drink the water which is not clean. Another thing is when you are in the forest you cannot stay as if you are in the city. Sleep with bed net." (Aunty Lu)

"In the past I got malaria. Malaria was cured when I started working in apiculture business." "The Sin-tone-ma-nwe green tea can be drink for the prevention of malaria." "You must drink boiled water, wear warm clothes, and sleep with bed net." (U Lay Maw)

"Malaria can be prevention by preventing mosquito bite and by avoiding foods that cause malaria such as bamboo shoot, sour (fermented) and spicy foods." (Ko Si Thu)

"Malaria can be prevented. You must sleep with bed net and prevent yourself from mosquito bite. You must not drink San Yay. You must not eat banana." (Ko Tun)

"To be able to prevent malaria, you must clean the dish and you must make sure your Yay Oe (earthen pot used as water container) is securely covered (so that mosquitoes cannot lay eggs). (confused between DHF and malaria.)" (Myo Nyein)

4.7.5 Belief that the bee poison, and hence the bee sting injury encountered in their daily life, can prevent from malaria

Bee poison has been used to cure joint pains and for some diseases of the nervous system. The origin of using bee sting seems to be Chinese acupuncture. Some of the bee keepers who are in contact with the Chinese traditional medicine are using bee poison to treat patients suffering from stroke and joint pains. They also suggested to treat different kinds of diseases using the bee poison. With these suggestions, bee keepers believe that they are automatically protected from malaria since they have been attacked by the bees every day, got bee sting injuries and had bee poison/venom in their blood. It is an extra work for them to sleep under bed net or ITN since they are already protected from malaria by the action of bee poison.

"After working as a bee keeper I didn't get any malaria attack." (Ko Chit, bee keeper)

"Pyarr Seik (bee poison) entered into the body by the action of Pyarr Toak (bee attack) kills pathogens in the body and malaria and AIDS strains in

the blood vessels. But a single attack is not enough. Even the western medicine courses need 4 to 5 days to complete the course." (Aunty Lu)

"Being attacked by bees can prevent malaria. I've seen an old Chinese man in Myit Kyee Nar who used bee poison to cure his disease." (Hlaing Myint Htun)

"Bee poison can also kill malaria parasites." (U Lay San)

4.7.6 Prioritization of health problem and belief with own health status: We are healthy and don't need any prevention.

Beekeepers were engaged in apiculture industry for the purpose of making money. Money is everything. Other things including malaria are not as important as business.

"Money is the first priority in life. So beekeeping business is important because I can make money from this business. My friend beekeepers are also important because we are depending on each other in the business." (U Lay Maw)

"There is no health problem except viral hepatitis." (Ko Si Thu)

"I had common cold long time ago. It was cured by taking drugs bought from the pharmacy." "If you can take care of yourself, you'll be healthy. I didn't have any serious health problem so health problem is not so important in my life." (Ko Thet)

"Important health problems are hypertension and heart diseases. Other diseases are not important." (Ko Tun)

"According to my experience, dengue fever is more important than malaria because it is fatal." (Ko Cho)

Those who think they are tough, strong and healthy enough didn't use any bed net or ITN because they think there are so strong that it is not possible for them to get infected with malaria.

"I always stay 'pay pay tay tay' (= sleeps, eats or stay without any timetable and without any standard). I sleep not only without any bed net but also with the upper part of my body naked." "Nothing happens." (Ko Naing)

4.7.7 Belief on priority of life: money is the most important thing in life

The effect of priority in life is reflected in ITN usage. For most of the bee keepers, their apiculture business is more important than any other things in their life. It is true also for malaria disease and its prevention using ITN and other means which become less important according to their prioritization.

> *"Priorities in my life are (1) To work, (2) to get money. But healthy living is also important." (Ko Si Thu)*
>
> *"To be a human being is quite satisfactory for me. The most important thing in life is to work for the survival. Marriage is also important." (Ko Thet)*
>
> *"Everyone have to create one's own life. My priorities in my life are my parents. Second priority is my work. Time is also important in life." (Ko Tun)*
>
> *"Work is more important than health. I don't like to sit while others are working. When compared, work is the first priority. Socializing is the second and health is the last priotity." (Ko Naing)*
>
> *"There are many important things in life. The most import thing is to get success with the business by trying yourself. My priorities in life are my parents and my younger sister. It is also important to stand on my own feet. Health is not important." (Ko Soe)*
>
> *"In my life, the first priority is my mother. Second most important thing is money. If there's no money, you're inferior, you don't have face and you'll be oppressed by others. If there's money, you can do whatever you want." "If there is no money, you dare not go into the community and you can't compare yourself to others. If there's money, you can bravely go into the community and you can face everything." "I was looking for a way for development of my life and I'm lost." (Ko Cho)*

4.7.8 Belief on ITN effectiveness and side effect

Some did not belief that ITN can prevent malaria. For some of the beekeepers, side effects of insecticide used in ITNs can be a reason for poor ITN usage. No one likes to suffer from the side effects of insecticide. If a beekeeper encounters any side effect of ITN, he will belief that it is going to continue that experience if he continues to use it. There is the potential of spreading the information to other beekeepers through friend beekeepers.

> *"I've never used ITN. It might be good but there is no difference compared to an ordinary bed net. An ordinary bed net can also prevent mosquito. (It*

is putting burden by adding extra work to use insecticide.)" (Ko Naing, beekeeper)

"I don't have any knowledge on ITN and seen an ITN. In my native I once received a tablet to impregnate but I didn't use it. I didn't receive any such tablet as a beekeeper." (Ko Soe, beekeeper)

"Once I received an ITN when I was in the village but I gave it to my mother. The mosquitoes can also be found near an ITN. (He meant the ITN effectiveness is not different from that of ordinary bed net)" (Ko Cho, beekeeper)

"I tried to sleep in an ITN once. It was owned by a friend. There's a kind of smell. (His face showed dislike sensation. I told my friends about that." (Ko Toe)

"In 2009, I tried impregnating my bed net. I got a sensation of 'hot flashes' in my face. I didn't try it again. Other beekeepers also know that they are reluctant to use it." (Ko Min)

4.7.9 Belief on gender: presence of female or couples in a group

It was the traditional belief for the men to give respect to and take care of a woman. It was observed that those beekeepers that did not use any bed net are from the groups with no lady or no couple. For groups with a lady or a couple, group member beekeepers use bed net and there is the better possibility to use ITN in those groups.

"Sleeping without a bed net makes me feel that I was sleeping naked." "I never sleep without a bed net." "Everyone in the group sleep under bed nets. When there is a woman in the group, it is not suitable to sleep without bed net." (Aunty Aye)

"For a couple, it is not suitable to sleep together without a bed net. The bed net can provide privacy for a couple. As a migrant, it is difficult to get a separate room for couples. The presence of a couple in a group also makes others to sleep with a bed net." (U Kyaw)

"The presence of a woman is a burden for a group of beekeepers. Everybody has to take care of her with every aspect. In this camp there is no woman, every beekeeper can sleep free without any bed net." (Ko Naing)

Table 4.4 Myanmar terminology and meaning

Myanmar	Pronounciation	Meaning	Page
ငါးရက်ဈေး	Ngar-yet-zay	Every-5th-day market	44,45

Myanmar	Pronounciation	Meaning	Page
ငှက်ဖျား	Hnget-phyar	Malaria	48,49
တောကိုင်	Taw-kine	Curse by forest god	48
နတ်ကိုင်	Net-kine	Curse by got	48
ဆရာ	Saya	Teacher/boss/professional (male, used to show respect)	48,49 53,60 74,95
ဆရာမ	Sayama	Teacher/boss/professional (female, used to show respect)	48
ငှက်ဖျားပိုး	Hnget-phyar Poe	Malaria parasite	49
ငှက်ဖျားခြင်	Hnget-phyar Chin	Malaria mosquito	49
ခြင်	Chin	Mosquito	49
ခြင်ထောင်	Chin Htaung	Bed net	49
ဆေးစိမ်ခြင်ထောင်	Say-sein Chin Htaung	Insecticide treated net	49
ရိုးရိုးခြင်ထောင်	Yoe-yoe Chin Htaung	Ordinary bed net	49
အဖျား	Aphya	Fever	49
ဝါဆိုဦး	War-so-U	Start of Buddhist lent	45
သီတင်းကျွတ်	Tha-din-gyut	Lighting festival held on Fullmoon day of Thadingyut (October)	45
ကထိန်အောင်ပွဲ (ကထိန်ပွဲ)	Ka-htein Aung Pwe (Ka-htein Pwe)	Ceremony for successful Kathina robe donation	45
သုံးဆယ်တပေါင်းပွဲ	Thonze Dabaung Pwe	Pagoda festival in Thonze Village held in the month of Dabaung (March)	45
သင်္ကြန်	Thin-gyan	Water festival	45
ဇီးပျား (ဇီးပျားရည်)	Zee Pyar (Zee Pyar Yay)	Honey produced from plum flowers	53
ပုဇင်းထိုး	Ba Zin Doe	A kind of Bird that eats bees	53
ပုတ်သင်ညို	Poat Thin Nyo	Lizard	53
ပျားပုံး	Pyar Pone	Beehives box	53,59 61,62 64,85
ဘုန်းကြီးကျောင်း	Phone-gyi Kyaung	Monastery	54
ပွဲလမ်း	Pwe-lan	Festival	54
ကြူအင်းကျောင်း	Kyu Inn Kyaung	Kyu Inn Monastery	54
ပျားရည်	Pyar Yay	Honey	53,54
ဘုရားကျောင်း	Pha-ya Kyaung	Church	54
ပုတီး	Ba-dee	Rosary beads	56
တမတ်	Ta Mat	A coin equivalent to one-fourth of one Myanmar Kyat	56
ရှော်တယ်	Shor Tel	A kind of small motor boat used in Chin Twin River	57
ပွဲရုံ	Pwe Yon	A brooker's house	57
ပျားသမား	Pyar Tha-mar	Beekeeper	57
ဘိန်းဖြူ	Bein Phyu	Heroin	57
ဘိန်းမည်း	Bein Me	A kind low concentration heroin	57

Myanmar	Pronounciation	Meaning	Page
ပျားလုပ်ငန်း	Pyar Lot Ngan	Apiculture (beekeeping business)	58
ပျားပေါင် (ဘောင်)	Pyar Baung	Frame for beehive foundation	58
ပျားဘုရင်မ	Pyar Ba-yin-ma	Queen bee	59
မြတ်မွေးလိမ်ပျား	Myat Mway Lein Pyar	A kind of small bee species occurring in Kachin State	60
သစ်ခေါင်းပျား	Thit Khaung Pyar	A kind of bee that naturally stays in wood cavities	60
မွေးမြူရေးပျား	Mway Myu Yay Pyar	Domesticated bee	60
ဖြုတ်	Phyoat	Sand-fly	60
အဖိုး	A Phoe	Grandfather	60
ပျားချေး (ပျားချီး)	Pyarr Chee	Bee shit = bee pollen	60
ပျားကေဒါ	Pyar Kay Dar		60
ပျားဦးထုပ်	Pyar Oak Htoat	Bee hat = hat and veil, i.e. a covering for head against bee attack	69
ပျားသေနတ်	Pyar Tha-nat	Bee smoker	70
မျက်စေ့တိမ်ကျ	Myat Si Tein Kya	Corneal opacity	71
တိမ်	Tein	Cloud = opacity in eye	71
မျက်ကြောထ	Myat Kyaw Hta	Pterigion	71
ပန်းသုံးဆင့် (ပင့်ကူထိပ်ပိတ်)	Pan-thone-sint (Pint-ku-teik-peik)	A kind of herbal plant that grows naturally in Kachin State	71
တင်းတိပ်	Tin Tate	Freckles	71
ဝက်ခြံ	Wet Chan	Acne	72
လေနာ	Lay Nar	Peptic ulcer disease	72
ဝတ်မှုံ (ပျားဝတ်မှုံ)	Wut Hmone (Pyar Wut Hmone)	Bee pollen	72
ထုံနာကျင်နာ	Hton Nar Kyin Nar	Tingling and numbness sensation caused by some neurological disorders	72
ပျားတုပ်ခံ	Pyar Toat Hkan	Receive bee sting attack	72
လေဖြတ်လူနာ	Lay Phyat Lu Nar	Stroke patient	72
ပျားဆိပ်	Pyarr Seik	Bee poison	73
မေးခိုင်ရောဂါ	Mae Hkaing Yaw Gar	Tetanus	73
ပျားနို့	Pyar Noh	Bee milk = royal jelly	73
ပျားဖယောင်း	Pyar Pya-yaung	Beeswax	73
တဲ	Te	Tent	74
မိုးကာတဲ	Moe Kar Te	Tarpaulin tent	74
ဆင်တုံးမန္ဓယ်	Sin-tone-ma-new	Guduchi or *Tinospora cordifolia*	88 106

CHAPTER V
DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

The study and analysis on health system showed that the government ministry of health in malaria control project has the less power compared to non-profit organization. In Myanmar, there are 80 malarious townships where 63% of country's population, i.e. 37.39 million people are residing according to 2010 data (MOH, 2013). There are limitations in the primary health care programme provided by the ministry of health for the remote rural areas where approximately 70 percent of country's population resides. In the health care delivery system of Myanmar, the grass root level health care providers in the rural areas are the basic health staffs (BHS) the majority of which are midwives (MOH, 2013). The BHS are taking the responsibility for "maternal and child health care, nutrition promotion, school health, environmental health, expanded programme of immunization and activities for controlling diseases, such as TB, malaria, HIV/AIDS, leprosy, and other communicable diseases" at the grass root level of rural areas where. They are also collecting the data on health and health related information and are preparing monthly reports (MOH, 2013). For BHS of the Nawnghkio Township, they are also taking responsibility for some more pilot projects such as reproductive health pilot project. There are 67,285 villages in Myanmar and the majority of population of Myanmar is staying in rural areas. The primary health care for rural population of the government is relying on the midwives and community health volunteers. The number of midwives is (20,044) (MOH, 2013) so most of the villages are lack of midwifes. Previously (23,322) voluntary health workers (V H W) are trained to fill the gap (MOH, 2011) . But lack of support and monitoring system for VHW resulted in the failure of the volunteer programme (Lin, 2011). The findings of this study also reflect the similar failure in which there are 25 midwives for 250 villages. The Township Health Department

trained 176 VHWs of which only 73 (41.477%) are functioning (NTHD, 2012). As a consequence, non-governmental organizations got the chance to take the position as main body for malaria control in the Community Based Malaria Control Programmes in selected townships starting 2006-2007 which was expended to 94 townships after 1991 (MOH, 2013). The international donors directed their funding to those INGOs which hold the stronger side in the power relationship against the government sector as well as against the community. Although the literature on critical medical anthropology referes to various levels in the context of hospital setting, CMA in this study will refer to the context of malaria control project at its various levels of hierarchy.

Although the INGOs are working as non-profit organizations, the policy makers are oriented towards the donors and availability of funding. The profit making orientation of project policy makers is argued by the findings of this study. The idea of controlling everything by the project policy is not reliable in the background of migration. That kind of idea neglects the cultural belief system of people.

The idea behind planning of malaria project is based on epidemiological and public health perspective which is reflect in the criteria for the free distribution of ITNs to the community. The migrant groups including beekeepers were considered as statistically not significant, were considered as negligible and were set in the exclusion criteria. The policy makers thought that the malaria could be controlled although they do not emphasize on the migrants and the beekeepers. The findings revealed that the migrant beekeepers were still unprotected from malaria and they are becoming the pocket groups of malaria and are holding the potential to spread the disease into the local communities situated along their destination places as they mobilize with their seasonal business mobilization. So the reasoning of the project policy makers was found to be totally wrong and the migrant beekeepers are still vulnerable to malaria. The project policy makers should consider alternative ways to include beekeepers and migrants in the malaria programmes. The idea to control everything especially controlling with the ITNs was also found to be wrong since the seasonal mobilization is the life of the beekeepers and it was not fair when they treated the beekeepers and migrants separately from the local community. The policy makers of the INGO

malaria project were found to be absolutely discriminating the beekeepers and migrants.

The ITN technology is very effective and is a success of scientists in controlling malaria (Klinkenberg et al., 2010), the scientists encourage ITN use in malaria control programmes (Binka, Hodgson, Adjuik, & Smith, 2002) . The studies indicated that the migrant groups are at high risk of malaria infection (Kritsiriwuthinan & Ngrenngarmlert, 2011). But the migrant beekeepers in the study were clearly left unprotected from the disease. While the malaria project policy makers were found to be responsible for the negligence, the local villagers are also found to be discriminating the beekeepers so that the beekeepers are separated from the local communities and are not accessible to ITN and health education services provided for the community. The study found that the dispute arouse based on the argument of local villagers that the beekeeping industry was destroying the crop production. Although the previous researches have already supported the fact that bees help crop production (Breeze, Bailey, Balcombe, & Potts, 2011; Greenleaf & Kremen, 2006; Holzschuh, Dudenhöffer, & Tscharntke, 2012) and the crop production was increased in certain bee population densities (Sabbahi, de Oliveira, & Marceau, 2005), some researches pointed the possibility of depletion of pollens by increased number of bee population (Stanghellini, Schultheis, & Ambrose, 2002) and possible reduction in pollination and production rate at high bee population densities (Dedej & Delaplane, 2003). An agricultural and entomological research will be needed to solve the dispute between the local villagers and the beekeepers. The beekeepers were trying to have a good relationship with the local villagers. The ITN technology, the apiculture technology and the techniques of using honey and bee products in this study all are representing the 'technoscape' in the concept of migration (Appadurai, 1996).

In the context of migration, the cultural beliefs found in migrant beekeepers represent the 'ideascape' suggested by Appadurai (Appadurai, 1996). The ideascape is also represented by the idea of local villagers on beekeepers as destroying their crops and the idea that generated the policy of the INGO. Addressing on the cultural and the health beliefs is a quite rare in public health projects. The cultural beliefs plays important role in malaria control just like (Dunn, Le Mare, & Makungu, 2011) found in their study in southern Tanzania in which use of bed net was restricted

in some cultural settings. Many of the previous research on cultural beliefs related to malaria were studied in Africa and the findings on belief system on ITN use for malaria control in this study were found to be different from African setting. In the context of migration, the biomedical knowledge of malaria parasite being transmitted through mosquito is combined with the traditional belief of malaria disease being caused by drinking unclean water and food from the forest. The combination of two ideas of biomedical knowledge and traditional beliefs generated a new belief of malaria aetiology in which beekeepers expressed their belief on malaria as being caused by drinking of water from the rivers or streams containing mosquito eggs and malaria parasites and by eating of food malaria infested from mosquito bites. The traditional knowledge of using bee poison to cure some diseases is also linked by the beekeepers to perception of malaria preventive effect of bee poison. For beekeepers with such kind of belief system, it will be difficult to accept the use of ITN fro the prevention will not be reasonable. As described in their paper, knowledge on ITN has great influence on ITN usage (Adongo, Kirkwood, & Kendall, 2005). Providing knowledge by behavioural change communication activities should be targeted more on marginalized beekeepers. An understanding on the cultural background and traditional belief system of the target group will result in effective designing of health education techniques and malaria prevention and control strategies.

The prioritization of business and financial success is also found to be important when beekeepers thought the beekeeping business as their top priority in life and all the other things become less important and hence the health and prevention from malaria also becomes a less important thing in their life. The prioritization of financial success of beekeepers, argument of the local villagers with their crop production in relation to the beekeeping industry and the profit-making orientation of the policy makers represent the ‘financescape’ in the Appadurai’s concept of migration (Appadurai, 1996).

The ‘ethnoscape’ in the migration concept was represented in this study by all the migrant beekeepers and the local villagers.

The studied beekeepers were found to be using radios as a media for listening to music. Although they listened to the radio, there was no health education programme or channel that broadcast malaria education for people. The purpose of

radio programmes was only for entertainment and the 'mediascape' mentioned in the theoretical concept of migration appeared in this paper as a failure in the sense of utilization for health knowledge.

The findings suggested the seasonal mobility pattern of migrants is going to continue to take place and there is a future possibility of continued migration related problems in the area including the malaria problems. The policy needs to emphasize on the issue and needs to develop strategic solutions based on deep understanding on the situation from the expended detailed research studies.

5.2 Conclusion

The study explored the determinants of insecticide-treated bed net use to prevent malaria among the migrant beekeepers in Nawnghkio Township using critical medical anthropology perspective based on the context of migration.

5.2.1 Migration context

Initially, the background setting and the characteristics of the beekeepers were studied. The environmental condition of the study area is a good home for *Anopheles* mosquito species. The air is warm and humid. The altitude is within the range suitable for the mosquitoes. Abundant water resources of small rivers flowing across the forests and agriculture farms are good breeding places for reproduction of mosquitoes. It is not a wonder that malaria is enrooted in the area which is listed in the malaria endemic areas of Myanmar and the Township Health Department is prioritizing the malaria on the top of the priority diseases list each year. Majority of the population had suffered from the burden of malaria until Myanmar was one of the countries where the global and wide spread malaria control activities are carried on. Many people staying in the Nawnghkio Township also benefited from that and at the time of the study, majority of population at risk were protected from malaria. The growing economy based on agriculture and agricultural based industry and forests based business is attracting many people to migrate to the area, i.e. it is working as a

'pull factor' in the context of migration. But a small percentage of the township population is still unprotected and they include various groups of migrant workers including the beekeepers.

When studied and analyzed based on the concept of five 'scapes' of (Appadurai, 1996), being the migrants, they are more exposed to risk of getting malaria. They are moving from place to place for their business and at the same time they are exposed to malaria risk. They are among the highest risk groups in the study area to get malaria. They are also important source of infection that maintain malaria within their group and spread the disease to the local villagers in every place they move. In other words, they can be called as the pocket groups of malaria.

Malaria protection status was accessed in terms of ITN usage and malaria knowledge. While all of the surveyed data is pointing that the local villagers are well protected from malaria, migrant beekeepers interviewed were almost entirely unprotected. Two main reasons can be concluded as factors responsible for that. First is the accessibility to ITN and second is the acceptance of ITN. All of the surveyed migrant beekeepers did not have any ITN in hand and were not using any ITN at the time of study. Poor ITN ownership status was found to be related to poor accessibility to ITNs and lack of ITN knowledge.

Being discriminated as migrants and beekeepers made them lack of accessibility to ITN and ITN knowledge resulting poor ITN usage. As migrants, they have their own original places, cultures and traditional beliefs. In the context of migration, there is exchange of ideas among people of different places and cultures. Malaria beliefs expressed by the beekeepers are found to be combination of ideas, i.e. they mixed the ideas of local traditional beliefs and some idea coming from the modern biomedicine. Lack of proper malaria knowledge caused beekeepers to continue with their combined misbelieves regarding malaria which leads to poor attitude and practice with ITN usage, and also with malaria prevention and treatment.

5.2.2 Health care delivery system and the critical medical anthropology perspective

While the government Department of Health is not efficient, the INGO was the main body for malaria control. The power related to malaria control is in the

hand of the INGO. The INGO top officials become the policy makers of malaria prevention and control for the township.

The donor oriented policy makers of the non-profit organization held the profit making policy and set the criteria of ITN distribution to the community. The migrants were excluded in that criteria and the reason being the difficulty to control them.

While local villagers could easily get ITNs free, the beekeepers were not accessible to ITNs. Why are the beekeepers left out of the important malaria preventive and community mobilization activities? The criteria of the malaria project limited the migrant beekeepers from the accessibility. While the project distribute long lasting insecticide treated bed nets to the local villagers during their ITN campaign activities, the criteria of the project excluded beekeepers as migrants. So no beekeeper received an ITN from the project in Nawnghkio Township.

Although they did not receive free from the project, there was the possibility for the beekeepers to be accessible to ITNs if the ITNs were sold in the market, i.e. in local shops, and if they have the proper knowledge on malaria causation and prevention methods. Both of these possibilities were destroyed and the policy of the malaria project can be blamed.

After free mass distribution of ITNs in the community, everybody except the minority owns ITN and nobody wants to buy it from the shop, i.e. there was low market demand for ITN. There was no shop in the area selling the ITN. Even if the beekeepers who know about ITN want to buy ITN, it was not available and not accessible. The minority beekeepers were made inaccessible to ITN directly by the exclusion criteria of the malaria project set by the INGO and indirectly by free mass distribution with resultant reduced market demand and lack of ITN in the market.

Migrants including beekeepers are related to malaria outbreaks. The local villagers didn't know that kind of relationship. If the local villagers knew the importance of migrants including beekeepers in the transmission of malaria, they can consider for the migrant beekeepers and make efforts so that beekeepers and other migrants were not excluded during the ITN campaigning activities. Did the project policy makers have any knowledge on the importance of migrants in malaria control? The project officials of the INGO know that kind of causal relationship. But the

project did not emphasize the fact that the migrants are related to malaria transmission. It was a kind of monopoly played by the project in which there was a malaria knowledge difference among the project officials and the community in the area. The officials know the importance of migrants in malaria control but they did not emphasize on it. The reason of the project officials was their intention to control everything and the difficulty of migrants to control with their underlying prioritizing of keeping a good image and donor attention. The policy makers of the INGO prioritized more on the funding coming from the donors and it was easy for them to neglect beekeepers whose numbers was considered statistically not significant compared to whole project area. Many INGOs compete each other to be recognized by the big funding providers and donors. Donors select the best INGOs to provide funding for development projects. INGOs need to improve their image in the view of donors. To get a better image of the organization, they are careful in implementing project activities. They need to make control of things in their responsibility to maintain a good image. Excluding migrants including beekeepers is one of the efforts in response to such kind of policy.

5.2.3 Belief system

For the second part of the study, the ITN usage potential among beekeepers was accessed. The knowledge, belief, attitude and practice of beekeepers related to ITN usage for the malaria protection was accessed.

Being migrants, they are originally from different places within the same country. Being able to communicate each other and with the local villagers, there was exchange of information, knowledge, idea, beliefs, practices and tradition. It is evident in exploring their belief on causes of malaria where most of them mentioned the common and strange idea of malaria parasite being transmitted through unclean water and food along with other beliefs. As migrants, they move from one place to another and carry the knowledge along their way. The idea that bee poison can prevent malaria or even kill the malaria parasite in the blood probably has acquired from the use of bee poison to treat some neurological disorders and joint pains and wide spread of bee products. In reality, the bee poison cannot prevent from malaria. One of the

beekeepers is an experienced and educated and his explanation clarified the lack of ability of bee poison to prevent or cure malaria disease.

> *"I still had malaria until ten years after I started working as a beekeeper. I got many bee sting injuries during those ten years. If the bee poison can prevent malaria, I would not have malaria then." (U Kyaw, beekeeper)*

Similarly, the belief that there are malaria parasites in the unclean water and some kinds of foods in the forest seems to be a result of combination of ideas of traditional belief on unclean water and food from forest as causation factors of malaria and modern idea from biomedicine that malaria parasite is transmitted through the bite of infected *Anopheles* mosquito.

The belief that malaria is caused by other things rather than transmission through mosquito bite made the beekeepers irrational to accept bed net and ITN usage for the prevention of malaria. Similarly, when a beekeeper beliefs bee poison can prevent and cure malaria, it is reasonable for him not to emphasize on the use of ITN or even bed net. They got the false sense of security after following the protective behaviours based on wrong beliefs such as drinking of boiled water, avoiding of fruits from the forest to prevent malaria and working in bee yards to get the believed preventive effect of bee poison from bee sting attacks.

The belief that business success is the most important thing in life and other things are not important also makes them neglect the danger of malaria.

It is difficult to change the attitude, practice and behaviour of a community when there is enrooted idea of belief system as underlying rationale of those attitudes, practices and behaviour. But the behaviour of the local villagers was changed by the health education and behaviour change communication activities including ITN campaigns. Repeated and strategic health education and ITN campaigns was found to change the past traditional belief on malaria among the local villagers. It was the proof that, although difficult, the belief system can be modified or changed by the effective education to the community. The malaria project showed that kind of ability to change the belief system and hence the behaviour of local people. While the local villagers were found to be using enough ITNs which they received from the malaria project free of charge. The locals also have rich knowledge on malaria disease and prevention methods although they used to hold traditional wrong beliefs on the disease in the past.

Community mobilization and health educations by the malaria project targeted at the local villagers were found to be very effective and were a success. So it is believed that the wrong ideas regarding malaria that persist and spread among the beekeepers can also be changed if they are emphasized as the main target group.

5.2.4 Discriminated social relationship

The (Oxford, 2013)) defined discrimination as "the unjust or prejudicial treatment of different categories of people". In this setting, the discrimination of local villagers was found to be targeting on the migrant beekeepers. Discrimination consists of discriminatory ideas and practices. The study revealed the idea of local villagers regarding beekeeping business, i.e. the idea that bees destroy the crops. Discrimination was practiced by rejection to accept bee yards near the villages and by destroying the beehives. The discrimination of villagers is a danger for the beekeepers in terms of destruction of the beekeeping business, and of being at risk of malaria. There was restriction, exclusion and rejection of beekeepers from the opportunity of getting ITNs available to villagers based on rational decision making. For the villagers crop production destroyed by bees was rational because the overcrowded bees were seemed to be destroying the crop production by taking away all the pollens from the flowers of the crops leaving no pollen for successful pollination. As a result, there was exclusion of beekeepers during ITN campaigns, LLIN distribution and health education activities.

The beekeepers were treated worse than other migrants in the area and the reason was arbitrary. Yes, other migrants are included in ITN campaigns because the village leaders considered in favour of including them during the ITN campaign activities whilst the beekeepers were separated and excluded.

Health education and community mobilization sessions were opened to everybody. Anyone interested can attend, listen to, discuss and ask questions. Bee keepers did not attend because they separated themselves from the local community as a result of discrimination.

On the background of disputes regard to poor crop production which is assumed by the locals as caused by the bees, the local villagers did not invite

beekeepers to health education sessions which accompanied the ITN campaigns giving the reason to the criteria of the project.

Potential to use ITN is depending on malaria and ITN knowledge, belief, attitude and practice as well as their perception on life and life priority. The success in beekeeping business was found to be the top priority in a beekeeper's life. For the successful beekeepers, beekeeping is a good business and has the potential to earn a lot of income. So they emphasize on the business than any other thing. For the beginner and learner beekeepers, being inspired by their seniors who are successful beekeepers, they also put beekeeping business as the most important in their life neglecting other things including malaria. That attitude is supported by the idea of wrong beliefs regarding malaria and the false sensation of protection by the bee poison.

The INGO officials making the policy of the project are playing at the macro-social level of the critical medical anthropology perspective. Their orientation to prioritize the availability of donor's funding is a kind of profit making and they are interacting at the international level. Based on that priority, the policy determined the criteria to distribute ITNs to the community. According to the criteria, the beekeepers were excluded; they did not receive any ITN and malaria knowledge, and were left unprotected from malaria while the local villagers were protected from the disease. That policy of the INGO also affects the ITN market in the area. No shop in the area was selling any ITN because of lack of market demand. No villager wanted to buy an ITN when they were receiving ITNs free of charge from the project. The accessibility of ITN for the beekeepers was a difficulty then. The profit making orientation of the international level officials also results in poor transparency of the organization. While the budget is using for high salaries of project top officials and for the expensive apartments of head quarter offices, there was less budget utilization at the implementation level. The policy of the organization is made to indirectly support the profit of top level officials of the organization. At the same time the budget was kept secret for the grass root level staffs and the community. The top officials were found to be holding the power in terms of ability to make decisions on the policy. The power relation between the top level and the lower levels is revealed as lack of transparency and policy, and in the community, the top level power is revealed as the criteria set for

the distribution of ITNs. The final impact of that multi level power relation was the beekeepers unprotected from the disease.

The migrants are important in malaria transmission. Many malaria outbreaks in Myanmar were found to be associated with migrant groups. The INGO officials know that relationship. Although the migrants are important in malaria control, they did not emphasize that knowledge. They continue hiding that knowledge and insist on their policy and criteria to exclude migrants for ITN distribution. There was monopoly of knowledge and as a result, the community was not aware of the importance of migration in malaria control.

5.2.5 Social Determinants of ITN Usage

5.2.5.1 Social relationship with the local villagers

The relationship with the local villagers has no direct effect on the ITN usage. But indirectly, it affects in two ways. The ITN ownership was affected in two reasons: 1. total exclusion of beekeepers during free distribution of beekeepers. 2. made them lost the chance to get proper knowledge on malaria.

5.2.5.2 The health system

The health system provided treatment but made them less accessible to ITN by excluding beekeepers with the criteria. The ITN accessibility of beekeepers was also made difficult by the malaria project when the shops in the local market were not selling any ITN after project's ITN campaigns which made mass and free distribution of ITNs to all the local villagers.

5.2.5.3 The belief system

In the context of migration, the belief system related to nature of malaria disease, cause of malaria, prevention and treatment of malaria was found to be influencing the beekeepers' decision on ITN usage.

The social determinants of ITN use of malaria prevention among migrant beekeepers in Nawnghkio Township from the perspective of critical medical anthropology can be divided into two groups, first group of negative determinants include those that inhibit the usage and second group of positive determinants include those that encourage it.

The negative (inhibiting) factors are found to be profit making priority of the INGO malaria project, monopoly of knowledge on relationship of migration to malaria, discriminated social relationship, traditional beliefs related to malaria, life style of beekeepers and beekeepers life priority on business development.

The positive (encouraging) factors are found to be the friend/family member with the proper knowledge (on cause of malaria and ITN knowledge), the environment – mosquito friendly environment (mosquito nuisance) at the time of sleeping, and gender (presence of ladies or couples).

5.3 Limitations of the study

There are many beekeepers in Myanmar and are working in different areas under different settings. The government data showed there are over 2,000 beekeepers in Myanmar (MoLF, 2013). The scope in this research is too narrow to get the overall picture of all the migrant beekeepers of Myanmar. It is difficult to say that the findings in this research thesis describe the condition of all the beekeepers in Myanmar.

It would be much better if the beekeepers were followed along the way they move from one place to another. At the end of August and early September, many of the beekeepers working in Nawnghkio Township moved to the northern parts of Sagaing Region and Kachin State where there were fights between the government army and the KIA. It would be very risky to follow to those areas. When some of the beekeepers, at the same period, moved to south-west parts of Sagaing Region, it was still possible to follow but there was limitation with the research grant and it would need to take more time period to make such a thorough study.

Poor record keeping practice of the Department of Health, the INGO and the community was another limitation. For the township health department, the records were not digitized and the paper records were found to be difficult to follow. The reliability of the data is also considerable. For example, there was inadequate supply of diagnostic materials for the Nawnghkio Township Health Department before 2011 and it is difficult to estimate the number of undiagnosed malaria cases. The number of recorded cases was less than the real situation. So it is not possible to compare the data before 2011 and after that when there was more supply of malaria

diagnostic materials. It was also difficult to access the data of the government including the basic demographic data. Researchers cannot hope to be able to get the reliable detailed data of Myanmar at the third (townships) or fourth administrative levels (villagers/towns). For the INGO, they just count the overall data of whole township project. The purpose of the data complied by the INGO is only to make a good presentation to the donors. So it is not possible to compare the malaria morbidity of individual villages.

5.4 Recommendations

In the context of migration, this study explored the social determinants of insecticide treated bed net use among the migrant beekeepers in Nawnghkio Township of Shan State in Myanmar from the perspective of critical medical anthropology. The information in this study is for all the health care providers, policy makers, researchers and members of the community and can be used as a reference in doing further research, defining the policy and implementing the future malaria projects. Based on the findings of this work, following recommendations are suggested.

5.4.1 Policy

While the government is encouraging the development of beekeeping industry, the policy makers also need to notice the possible hazards exposed to beekeepers and should design training courses that cover health education topics including malaria. It was the responsibility of the ministry of livestock and fisheries and the ministry of health.

Malaria projects and projects on infectious diseases should emphasize, focus and should have more effort more on marginalized people.

Pocket areas or groups of malaria transmission should be highlighted in project planning phase of malaria control projects.

Non-profit organizations should be more transparent regarding to their policy, budget and knowledge distribution. The state policy should be emphasized on the regulation of non-profit organizations so that there will be a better transparency.

Behaviour change communication (BCC) and health education sessions should be a must for the beekeepers, migrants and patients using various different methods.

It was common for the people to mix and combine the ideas based on their traditional beliefs and experience resulting newly emerged ideas with the wrong message. One good strategy for effective behaviour change communication is to give the same information repeatedly so that people will not forget, memorize, change their attitude and behaviour. Providing much information within a short period of time can make confusion and mixing up of ideas.

Measures should be taken to provide better accessibility to ITN and other protective materials for malaria prevention. Alternatives of ITNs can be considered for those who do not want to use ITN and for those whose context does not suit to ITN usage. The possible alternatives include insecticide treated tents, insecticide treated clothing, mosquito repellents, etc.

Encouraging the involvement of women in the beekeeping industry can be considered to promote bed net and ITN usage.

Establishment of a reliable database system is also urgently recommended so that the health personals and the researchers can easily access the necessary data when needed.

5.4.2 Future research

Since there are a great number of beekeepers in different places of Myanmar, the research on those different places should be done to get an overall picture of Myanmar beekeepers using combined qualitative and quantitative methodology. Beekeepers are only one of many different migrant groups working in the area. More research is needed for those remaining groups.

There are other priority diseases and health problems in the area and my suggestion for research is also on those problems, and while making the study, I noticed other emerging problems of drug addictions, road traffic accidents, cigarette and alcohol related health problems, and other problems not related to health. They should also be inquired.

Since there are continuing disputes among the local villagers and the beekeepers regarding the role of apiculture (beekeeping industry) and crop production, a comparative study on different crop production rates depending on bee population is suggested.

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APPENDICES

APPENDIX A
GUIDELINES FOR IN-DEPTH INTERVIEW WITH BEEKEEPERS

1. Introduction
    1. Go to close friends who are staying in the study area
    2. Observe and look around the study area.
    3. Visiting of participants suggested by the close friends and choosing appropriate condition in approaching.
    4. Self introduction as a researcher and student
    5. Explanation of the research proposed and procedures and letting them read the information sheet already translated
    6. Asking for informed consent either signed or oral
    7. Voluntary interview to be conducted in appropriate and convenient time and place
    8. To get permission before using voice recorder or taking pictures
    9. To get permission to use real name. To use pseudonyms if they don't like their name to appear in the report
    10. Reviewing and testing of interview guidelines and modification if necessary
2. Demographic data (age, sex, ethnic group, marital status, religion, education status, work experience/duration, monthly income)
    1. How old are you?
    2. From which ethnic group are you from? It the informant is from ethnic groups rather than Burman, to ask the language ability.
    3. Are you married? And if the informant is already married, to ask about the children.
    4. Do you have any children?
    5. What is your religion?

6. Have you attended any school?
7. To which level have you learnt in school?
8. When did you start working here? Why?
9. Did you do the same job when you started to work here?
10. How much do you earn every month? Is it enough for the living?

3. History, pattern & nature of migration
    1. Where were you born?
    2. Which places did you already move before you came here?
    3. Where did you stay before you migrate to this place?
    4. Why did you move to this place?
    5. Are you going to stay in Nawnghkio area or are you moving to another area?
    6. Is there any relative or friend working here before you arrive in this place?
4. Working behavior related to risk
    1. Which time of the day did you start working?
    2. When did you finish your work?
    3. Which kind of clothe do you wear during you work?
5. Facility provided for workers
    1. What kinds of facilities do you have or are provided for you as a worker?
    2. What do you think of the facilities you have/provided?
6. Accessibility to health prevention and care services
    1. What did you do if there is any health related problem of you and your family?
    2. Are there any health care services near by? Is it easy to go there? Why?
    3. What kind of health care services are available there? Is there any health education service?
    4. Do you need to pay for any of these services? How much do you pay?
7. Life style out of working hours: living place, sleeping place, any peculiar behavior

    1. Where do you live? How do you live? In which kind of building do you live?
    2. With whom do you live together?
    3. What are you doing during your free-time? Do you watch TV or video? Do you read any newspaper, magazine, journal or any printed material?
    4. Where do you sleep? How do you sleep? With whom do you sleep?
8. Reasons for working in the current work
    1. Why are you working in the present work?
9. Perception on work
    1. What do you think of your work here?
10. Perception on working conditions
    1. What do you think of the working conditions here?
11. Perception on facilities provided
    1. What do you think of the facilities you were provided here?
12. Experience & perception on health care services
    1. Can you tell me your experiences when you went to health care services?
    2. What do you think of the health care services provided?
    3. What do you think of the behavior/relationship of health staffs?
13. Perception on life, priorities in life and health problem priorities
    1. What do you think of the life?
    2. What are the priorities in your life? Why?
    3. Which kinds of health problems are more important than others? Why?
14. Experience and perception on malaria (aetiology, symptoms, cure, prevention)
    1. Have you ever contracted with malaria?
    2. What happen when someone got infected with malaria?
    3. What cause people to be contracted with malaria? How do you know?/How did you get that kind of knowledge?
    4. Can malaria be treated? How? Where? How did you get that knowledge?
    5. Can malaria be prevented? How? How did you get that knowledge?
    6. Is malaria dangerous? Why? Who did you get that knowledge?

15. Experience & perception on bed nets and ITNs
    1. Do you have any bed net? Are you using bed net? Did you sleep under the bed net last night?
    2. Have you ever used a bed net before?
    3. For those who answer yes:
    4. When did you start using bed net?
    5. When did you stop using it? Why?
    6. How did you get the bed net?
    7. Was your bed net impregnated with insecticide?
    8. What do you think of bed nets?
    9. Do you know what an ITN is?
    10. Did you ever possessed any ITN?
    11. If yes, where is that ITN now?
    12. Do you have any experience with sleeping under ITN?
    13. Why did you stop using it?
    14. What do you think of ITNs?
16. Relationship with local villagers
    1. What do you think of the local villagers?
    2. Are they treating you well?
    3. Is there any problem with them? If answered yes, to ask more on the issue.
17. Relationship with other migrant workers
    1. What do you think of other migrant workers?
    2. Are they coming from the same place as you?
    3. If they are from different place, what is their idea/ opinion related to malaria and bed net?
18. Relationship with family members
    1. Who are your family members?
    2. What do you do if someone in your family got fever?
    3. Who sleep with bed net? Who don't sleep with bed net? Why?
    4. Who make most of the decisions in the family? Who he is a decision maker?

5. Who make the decision on treatment?
6. Who make the decision to use or not to use bed net?

19. Relationship with health care providers
    1. Have you been to any hospital / clinic / health care provider?
    2. Why did you go there?
    3. How did they treat you?
    4. What do you think of the health care providers?
    5. Did you get any information related to malaria from them?
    6. Did you get any information related to ITN from them?

APPENDIX B
GUIDELINES FOR FOCUS GROUP DISCUSSIONS

1. Defining participants, time and place
2. Preparing tools for FGD: Recorders, record papers and pen, record keeper, facilitator, reviewing and testing guidelines, modification of guidelines if necessary, and seating plan
3. Demographic data (age, sex, ethnic group, marital status, religion, education status, work experience/duration, monthly income)
4. History, pattern & nature of migration
5. Working behavior related to risk
6. Facility provided for workers
7. Accessibility to health prevention and care services
8. Life style out of working hours: living place, sleeping place, any peculiar behavior
9. Reasons for working in the current work
10. Perception on work
11. Perception on working conditions
12. Perception on facilities provided
13. Experience & perception on health care services
14. Perception on life, priorities in life and health problem priorities
15. Experience and perception on malaria (aetiology, symptoms, cure, prevention)
    Experience & perception on bed nets and ITNs

APPENDIX C
GUIDELINES FOR OBSERVATION

1. Selection of time and place for observation
2. Preparing tools: guidelines, camera, voice recorder, note book and pen, sleeping bag, mosquito repellents, mosquito net, rain coat
3. Reviewing and testing of observation guidelines and modification if necessary
4. Environment – presence of forests, rivers, streams or water resources suitable for breeding of *Anopheles* mosquitoes
5. Local villages – location, facilities, traditions, culture, malaria risk, prevention practice of local villagers especially ITN usage behaviour
6. Work place – malaria risk, potential for malaria prevention
7. Working hours related to malaria risk
8. Working tools related risk of malaria and malaria prevention
9. Working behavior related to malaria risk & prevention
10. Facility provided for migrants including malaria preventive and curative facilities
11. Accessibility to health education, prevention and care services
12. Life style out of working hours: living place, sleeping place, bed net condition, any peculiar behavior & social life related to ITN usage and malaria prevention
13. Family condition of workers – possible relationship to ITN usage
14. Relationship/communication with family members, co-workers, employers, local villagers, village health workers and health care providers that affect ITN usage

APPENDIX D
GUIDELINES FOR GROUP DISCUSSION WITH THE LOCAL VILLAGERS

1. Introduction
    1. Go to close friends who are staying in the study area
    2. Observe and look around the study area.
    3. Visiting of participants suggested by the close friends and choosing appropriate condition in approaching.
    4. Self introduction as a researcher and student
    5. Explanation of the research proposed and procedures and letting them read the information sheet already translated
    6. Asking for informed consent either signed or oral
    7. Voluntary interview to be conducted in appropriate and convenient time and place
    8. To get permission before using voice recorder or taking pictures
    9. To get permission to use real name. To use pseudonyms if they don't like their name to appear in the report
    10. Reviewing and testing of interview guidelines and modification if necessary
2. Demographic data (age, sex, ethnic group, marital status, religion, education status, work experience/duration, monthly income)
    1. How old are you?
    2. From which ethnic group are you from? It the informant is from ethnic groups rather than Burman, to ask the language ability.
    3. Are you married? And if the informant is already married, to ask about the children.
    4. Do you have any children?
    5. What is your religion?

6. Have you attended any school?
7. To which level have you learnt in school?
8. When did you start working here? Why?
9. Did you do the same job when you started to work here?
10. How much do you earn every month? Is it enough for the living?

3. Pattern & nature of migration of beekeepers
    1. What do you know about the migration pattern of beekeepers
    2. What do you think of their migration and mobilization?
4. Working behavior related to risk
    1. Which time of the day did you start working?
    2. When did you finish your work?
    3. Which kind of clothe do you wear during you work?
5. Facility provided for beekeepers
    1. What kinds of facilities did you see for a migrant beekeeper?
    2. What do you think of the facilities they have/provided?
6. Accessibility to health prevention and care services
    1. What did you do if there is any health related problem of you and your family?
    2. Are there any health care services near by? Is it easy to go there? Why?
    3. What kind of health care services are available there? Is there any health education service?
    4. Do you need to pay for any of these services? How much do you pay?
7. Life style out of working hours: living place, sleeping place, any peculiar behavior
    1. Where do you live? How do you live? In which kind of building do you live?
    2. With whom do you live together?
    3. What are you doing during your free-time? Do you watch TV or video? Do you read any newspaper, magazine, journal or any printed material?
    4. Where do you sleep? How do you sleep? With whom do you sleep?
8. Reasons for working in the current work
    1. Why are you working in the present work?

9. Perception on work
    1. What do you think of your work here?
10. Perception on working conditions
    1. What do you think of the working conditions here?
11. Experience & perception on health care services
    1. Can you tell me your experiences when you went to health care services?
    2. What do you think of the health care services provided?
    3. What do you think of the behavior/relationship of health staffs?
12. Perception on life, priorities in life and health problem priorities
    1. What do you think of the life?
    2. What are the priorities in your life? Why?
    3. Which kinds of health problems are more important than others? Why?
13. Experience and perception on malaria (aetiology, symptoms, cure, prevention)
    1. Have you ever contracted with malaria?
    2. What happen when someone got infected with malaria?
    3. What cause people to be contracted with malaria? How do you know?/How did you get that kind of knowledge?
    4. Can malaria be treated? How? Where? How did you get that knowledge?
    5. Can malaria be prevented? How? How did you get that knowledge?
    6. Is malaria dangerous? Why? Who did you get that knowledge?
14. Experience & perception on bed nets and ITNs
    1. Do you have any bed net? Are you using bed net? Did you sleep under the bed net last night?
    2. Have you ever used a bed net before?
    3. For those who answer yes:
    4. When did you start using bed net?
    5. When did you stop using it? Why?
    6. How did you get the bed net?
    7. Was your bed net impregnated with insecticide?
    8. What do you think of bed nets?
    9. Do you know what an ITN is?
    10. Did you ever possessed any ITN?

11. If yes, where is that ITN now?
12. Do you have any experience with sleeping under ITN?
13. Why did you stop using it?
14. What do you think of ITNs?

15. Relationship with migrant beekeepers
    1. What do you think of the beekeepers?
    2. Are they treating you well?
    3. Is there any problem with them? If answered yes, to ask more on the issue.
16. Relationship with health care providers
    1. Have you been to any hospital / clinic / health care provider?
    2. Why did you go there?
    3. How did they treat you?
    4. What do you think of the health care providers?
    5. Did you get any information related to malaria from them?
    6. Did you get any information related to ITN from them?

APPENDIX E
GUIDELINES FOR GROUP DISCUSSION WITH THE HELATH CARE PROVIDERS

1. Introduction
    1. Go to the study area
    2. Observe and look around the study area.
    3. Visiting of potential health care providers suggested by the close friends and choosing appropriate condition in approaching.
    4. Self introduction as a researcher and student
    5. Explanation of the research proposed and procedures and letting them read the information sheet already translated
    6. Asking for informed consent either signed or oral
    7. Voluntary interview to be conducted in appropriate and convenient time and place
    8. To get permission before using voice recorder or taking pictures
    9. To get permission to use real name. To use pseudonyms if they don't like their name to appear in the report
    10. Reviewing and testing of interview guidelines and modification if necessary
2. Demographic data (age, sex, ethnic group, marital status, religion, education status, work experience/duration, monthly income)
    1. How old are you?
    2. From which ethnic group are you from? It the informant is from ethnic groups rather than Burman, to ask the language ability.
    3. Are you married? And if the informant is already married, to ask about the children.
    4. Do you have any children?
    5. What is your religion?

6. May I know you educational qualifications?
7. When did you start working here? Why?
8. Did you do the same job when you started to work here?
9. How much do you earn every month? Is it enough for the living?

3. History, pattern & nature of migration of beekeepers
    1. Do you know any beekeeper in this area or have you met any beekeeper in this area?
    2. What do you know about their history, pattern and nature of their migration?
4. Working behavior of migrants related to risk of getting malaria
    1. Which time of the day did you see beekeepers working?
    2. When did they finish your work?
    3. Which kind of clothe do they wear during their work?
5. Facility provided for beekeepers
    1. What you know anything on facilities provided for beekeepers?
    2. What do you think of the facilities they are provided with?
6. Accessibility to health prevention and care services
    1. What do you think of the local villagers' and beekeepers' accessibility to health care services including malaria prevention and ITN usage?
    2. What are the health care services in the area? Is it easy for the beekeepers to go there? Why?
    3. What kind of health care services are available there? Is there any health education service? What is the target group of health education services?
    4. Are the people charged for these services? To ask more if answered yes.
7. Life style of beekeepers out of their working hours: living place, sleeping place, any peculiar behavior
    1. Where do beekeepers live? How do they live? In which kind of building do they live?
    2. With whom do they live together?
    3. Where do they sleep? How do they sleep? With whom do they sleep?
8. Perception on migrant beekeepers
    1. What do you think of the beekeepers?

9. Experience & perception with migrant beekeepers
    1. Can you tell me your experiences when you met with beekeeperss?
    2. What do you think of the beekeepers?
    3. What do you think of the behavior/relationship of beekeepers?
10. Perception on policy of the organization, project you worked with
    1. What do you think of the policy of the organization/project you worked with?
11. Experience and information on malaria situation
    1. How many years have you been working with malaria project?
    2. How many years have you been working in this area?
    3. What is the malaria situation and trend of the area?
    4. Is there any difference of malaria burden on the local villagers and migrant beekeepers? To ask for the reasons.
    5. Is there any difference of malaria knowledge among local villagers and beekeepers?
12. Experience & information on bed nets and ITNs
    1. Please explain the bed net and ITN situation in the area with the evidence and reasons
13. Relationship with local villagers
    1. What do you think of the local villagers?
    2. Are they treating you well?
    3. Is there any problem with them? If answered yes, to ask more on the issue.
14. Relationship with other migrant beekeepers
    1. What do you think of other migrant beekeepers?
    2. Is there any difficulty/problem in dealing with them?

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PUBLICATION / PRESENTATION	
AWARD RECEIVED	