

**THE ECOLOGY MODEL AND ON GOING PROCESS OF
CULTURE CHANGE: A CASE STUDY OF GANGAW
TOWNSHIP IN MYANMAR**

PhD DISSERTATION

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DEPARTMENT OF ANTHROPOLOGY

UNIVERSITY OF YANGON

MYANMAR

April, 2012

**THE ECOLOGY MODEL AND ON GOING PROCESS OF
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TOWNSHIP IN MYANMAR**

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This dissertation is submitted to the Department of Anthropology,
University of Yangon in partial fulfillment of the requirements for the
Degree of Doctor of Philosophy.

2012

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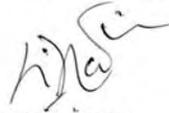
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ACKNOWLEDGMENTS

First of all, I would like to thank Dr. Mya Mya Khin, Professor & Head, Department of Anthropology, University of Yangon, who guided, advised and assisted me to fulfill this PhD thesis research as Chair Person and to her keen interest and permission to carry out this research.

A special word of thanks go to U San Win, Director General (Retired), Archaeology, National Museum and library Department, Ministry of Culture, who guided, advised and assisted me to fulfill this PhD thesis research as Referee.

I would especially like to acknowledge and thank Dr. Tin Maung Chit, Deputy Regional Health Director (Retired), Ayeyarwaddy Regional Health Department, Ministry of Health, who guided, advised and assisted me to fulfill this PhD thesis research as External examiner.

I am also deeply grateful to Dr. Thidar Htwe Win, Professor & Head, Department of Anthropology, Yadanapon University, my supervisor, for being very supportive and guiding me to stay on the track.

I would like to heartily acknowledge the Co-Supervisor, Sayagyi Dr. Tin Thein, Professor & Head (Retired), Department of Geology, University of Yangon who gave me the ability and the strength to complete this PhD thesis research.

My grateful thanks also go to Sayagyi U Kyaw Win, Director General (Retired), Department of Archaeology, Ministry of Culture, who gave precious ideas and advice and to Sayamagyi Daw Sein Sein, Director (Retired), Higher Education Department, Lower Myanmar, who gave help as well as advice in compiling this PhD thesis research from start to finish.

My heart-felt thanks go to Sayargyi Dr. Than Tun Sein, Director (Retired), Socio-Medical Research Division, Department of Medical Research, Lower Myanmar, Ministry of Health for his kind assistance in the application of Research Methodology to be able to use it systematically and for his invaluable guidelines to accomplish this thesis from the beginning to the very end.

A very special thank goes to Dr. Takatani, Michio, Professor, Social and Cultural Anthropology, International and Regional Study, Hiroshima University, who provided valuable suggestions and advice.

Furthermore, I am also deeply grateful to Dr. Aye Kyaw, visiting lecturer, Department of Anthropology, University of Yangon for his kindness, earnest support and encouragement from start to finish.

I also would like to thank Dr. Lei Lei Win, Director of Health System Research Division, Department of Medical Research, Lower Myanmar and Dr. Saw Saw, Research Scientist, Health System Research Division, Department of Medical Research, Lower Myanmar for their systematic instructions and guidelines to complete this PhD thesis.

I am also fortunate to have had the support of a great number of kind and dear friends, of whom I would particularly like to thank Senior Lecturer Daw Nilar Tin and Daw Khin Moe Moe Kyu, Lecturer, Department of Anthropology, University of Yangon who advised me to fulfill this PhD thesis research as members.

I especially give my 'thank you' to U S'San Thein, Editor (Retd.) of the Sarpaybeikman Board, Printing and Publishing Corporation, Ministry of Information, Human Development Officer (HDO) (former), Human Development Initiative (HDI) Phase-1, UNDP Translator and Social Mobilization Officer, Mangrove Service Network (MSN), for his kind and patient assistance to smoothly accomplish this thesis.

Thank you to my brother, Police Lieutenant Colonel Tint Aung (Police Force, Gangaw District) -- Daw Phyu Phyu Win who first introduced me to Gangaw and helped to direct my academic interests towards the subject matter of this work, and my eldest brother, U Kyaw Kyaw – Daw Thin Thin Oo and my elder sisters (Daw Nwe Nwe Htay) and Daw Nwe Nwe Aye for their kind help and assistance for the completion of this research. Thank you to my dear niece Thidar Aung, who sent me reference books from Singapore.

Last, but not least, I would like to acknowledge the members of the Village Peace and Development Council and the villagers who took part to answer my research questions in collecting the data for the PhD thesis research.

ABSTRACT

This study proposes that cultural ecological approach was used in carrying out the research: a case study of Gangaw Township in Myanmar. Ecology is the study of the working of ecosystem, of the behavioural interdependences of different kinds of organisms with respect to one another and their nonbiotic environment. Cultural ecology is the systemic study of the relationship between the environment and society. Therefore, cultural ecology is the study of the ways in which culture is used by people to adapt to their environment.

The aims of this study are to be able to link the natural environmental factors with socio-cultural system of the people in Gangaw Township and to explore the socio-cultural stability, modernity and education in the study area. Specific objectives include to elicit information on how the environmental changes and cultural ways of life are interrelated in the study area, to identify the adaptive strategies of the local people in the study area on the environmental changes and to make recommendations as regards how the positive aspect of indigenous culture should be maintained.

It was a Case Study performed at five study villages in Gangaw township. Data collection methods included the design of Ethnographic research, like qualitative research depending on the specific objectives of this study to correlate the documented data. The study villages are Shon Shi, Zahaw, Taung Kin Yan, Myauk Kin Yan and Kyaw villages which are situated in Gangaw township. The study took place from June 2008 to April 2012.

Key findings included that rural habitats in Gangaw Township were concerned with the cultural ecological development and **how human communities change themselves in order to change the way in which they use the natural environment.** In fact, it is now widely accepted that the development activities are associated with the natural environment management: roads construction, railway construction, government dams and hand-made dams in this township disturb the environment and ecosystem in diverse ways. These cause wide changes in the natural topography due to construction of roads and railway tunnel. These result in deforestation, soil erosion, degradation of catchment areas and variation in water levels, mineral contamination and a change in the micro climate which affects flora and fauna of the area. When studying the five study villages in Gangaw region, the

socio-cultural changes, environmental changes and their adaptability were emphasized dividing into four decades- 1970,1980,1990,2000,2010 (from 1962 to 2010).

It was also found that the main constraint in agriculture for Chin and Bamar (Yaw) nationals who live in this region is not getting enough water for agriculture. They however tried to solve this problem by creating hand-made dams and government dams. It therefore had to carry out the study based on parallel adaptation as there had been the development of similar cultural adaptation to similar environmental conditions by people of similar cultural background, and the researcher tried to observe the infrastructure, structure and superstructure in Gangaw Township. In doing so, both emic (native point of view) and etic (observer point of view) were included through using the methods of functionalism (functions interrelating with each other), comparism (comparing among five study villages) and materialism. Recommendations are made in consonance with the findings. Nevertheless, for certain parts of the data, the scope was uneven in detail, it is considered, however, it has enabled to reflect the reconstruction of environmental transformations during 1962 to 2010.

Key words: cultural ecology, socio-cultural changes, environmental changes, adaptability, parallel adaptation, environmental transformations

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LIST OF ABBREVIATIONS

ARI	Acute Respiratory Tract Infection
CDMA	Code Division Multi Access
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FGI	Focus Group Interview
FSWG	Food Security Working Group
HIV	Human Immunodeficiency Virus
IDI	In-depth Interview
IMR	Infant Mortality Rate
IUCD	Intrauterine Contraceptive Device
KII	Key Informant Interview
MRES	Master of Research
NGO	Non Governmental Organization
RHC	Rural Health Centre
SPDC	State Peace and Development Council
TV	Television
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund

CHAPTER (1)

INTRODUCTION

1.1 Background to the study

Ecology is the study of the working of ecosystem, of the behavioural interdependences of different kinds of organisms with respect to one another and to their nonbiotic environment ([http:// www.j stor. org/ pass/666726](http://www.jstor.org/pass/666726)). Few people today are unaware that the world faces an ecological crisis, the dimensions of which remain unclear. Each part of the globe has its own problems, but in Asia these are manifested in the rapid depletion of rainforests and the flora and fauna they contain, and the uncontrolled pollution which has accompanied industrialization and urbanization. To these can be added population pressure on the environment.

Anthropology has a unique contribution to make to the environment debate, partly because here anthropology has often successfully combined macro and micro perspectives. On the other hand, anthropology studies the long time-sequences of social and human evolution and this has caused it to pay special attention to the interaction between human culture and the natural environment. Attention to the environment has spawned a distinctive approach in anthropology, glossed as cultural ecology, which views human culture as adaptive system (Evans, Grant, 1993). Cultural ecology, Steward wrote (1955), is the study of the processes by which a society adapt to its environment. Its principal problem is to determine whether these adaptations initiate internal social transformations of evolutionary change.

In this context, it is interesting to note that the words 'economics' and 'ecology' have the same root, Oikos, which refers to 'house'. Economics deals with financial housekeeping and ecology deals with environmental housekeeping. On the other hand, the word 'bionomics' literally means 'management of life' and it derived from the same root (nomic: management) as economics. In most of the dictionaries 'bionomics' is listed as a synonym of ecology, but according to Eugenc P.Odum, 'the word may now be appropriate for an expanded economics of the ecosystem (Gupta, S.K, Sharma, V.P, Sharda, N.K, 1998).

The very existence of biodiversity causes various options of basic human needs: eating, clothing and shelter. There are in fact varied activities in fulfilling basic human needs and in exploiting natural resources depending on the difference in households, locality, family members, etc., and this difference is actually caused by

different kinds of destined conducts made by human beings for the fulfillment of their basic human need (Food Security Working Group (FSWG), 2011).

Environment refers to the totality of the external influences, natural or man-made which impinge on man and affects his well-being. It therefore embraces the socio-cultural environments (Helman, C.G, 1990). Moreover, it is important to study how weather, climate variability and change can influence upon population culture. Therefore, much attention will be paid not only to cultural patterns as adaptive responses to the basic problems of survival but also for reproduction among people living in this research area.

A very important fact in anthropological analyses of the environment is that of 'ecology' or human ecology. In detailed local studies, the emphasis has been on the way in which cultural values, world-views and perspectives, and technology shape and has shaped human adaptation to the environment and the exploitation of natural resources. In securing and sustaining their livelihoods, human communities are to manipulate the natural world (King, Victor.T and Wilder, Willan D, 2006).

1.2 Problem statement

Such problems as the development gaps among nations all over the world, the education and health requirements of the developing countries including natural environmental deterioration are to be eliminated in 2015. The sustainability of the natural environmental conservation thus becomes an essential activity of the entire human beings. Man should not destroy or ruin his natural environment of earth, water, forests and hills and mineral resources. He must guard and preserve them not only for this generation but also for the future generations. In fulfilling the needs of the present generation, he must keep in mind that he does not exhaust these natural resources. He must think of ways and means of continuous development of the generations to come in terms of the whole earth. With this idea in view, in 1992, "Earth Summit Conference" was organized in Rio-de-Janeiro in Brazil. In the discussions of Agenda 21", they gave directives for 21st century on progressive development and preservation of the human environment (Bk. no (20) a national Human Resources Development 2002).

The study of the diverse environments of South-East Asia has been especially important in Anthropology. Early post war studies paid particular attention to the

ways in which communities perceive, classify, use and adapt to their environment and the 'rationality' of source use. However, during the past three decades there has been a noticeable shift in emphasis to the examination of human induced changes in the context of the intensive exploitation of the natural resources of the region and the rapid transformation of natural landscape for commercial agriculture, infrastructure development, tourism and industrialization (King, 1998). Human ecologists are increasingly interested in documenting change and its sources, both in environmental events and in the historical processes of population growth, technological development, economic expansion, and political change (King, Victor T and Wilder, Willian D, 2006).

In Myanmar, too, development processes to upgrade the living condition of the whole nation as well as the conservation of the natural environment have energetically been carried out. Awareness raising campaigns on environmental conservation at different levels of state, division, district, township, ward, and village have been conducted: the activities including environmental greening, conserving the natural environment, regenerating its water, land and forest resources deteriorated by nature as well as by the commitment of human beings, conservation of watershed areas and the environmental degradation caused by shifting cultivation (Bk. no (20) national Human Resources Development 2002).

In Myanmar, the religious beliefs have led them to live in harmony with the environment. They believe that growing trees, building roads and bridges, digging wells and ponds, constructing rest houses and planting flower gardens are meritorious deeds and that they will be blessed with health, beauty and long life.

In this study, rural habitats in Gangaw Township were concerned with the cultural ecological development and **how human communities change themselves in order to change the way in which they use the natural environment.** In fact, it is now widely accepted that the development activities are associated with the natural environment management: government dams and hand-made dams in this township disturb the environment and ecosystem in diverse ways. These cause wide changes in the natural topography due to construction of roads and reservoirs. These result in deforestation, soil erosion, degradation of catchment areas and variation in water levels, mineral contamination, and a change in the micro climate which affects flora and fauna of the area.

Of course, the opportunity to accomplish this in Gangaw Township in Myanmar is dependent to a large extent on the quality and range of the published and archival materials. Before going into the field for direct research, the researcher analyzed available data, including photos, films, and business and government surveys: journalistic accounts; medical records: birth, death, marriage. Historical materials in the archives help the researcher to evaluate the usefulness of the observations and interviews he or she will document. Archival data can enrich the sources of information that fieldworkers obtain once the data were got to the field (Nanda, 1999).

In this region, the majority is Bamar national and the second large one is Chin nationals. Most of them are Buddhists, and some are Christians. In olden days, due to topography and weather condition of this region, communication was difficult and the only transportation for the whole year round was by air. Airways commenced in 1952 linking with Gangaw, Kalay, Kyaukhtu, Pauk, Pakokku, Mandalay and Yangon by 3 to 4 flights per week. Road transportation was available only in summer because floods by mountain torrents are quite common in the rainy season in this area. Only bullock carts are common in the rainy season by crossing Myitthar River on rafts. Log rafts are floated down the river in this area, and dug-out boats are used for transportation.

1.3 Justification

In the time of the Revolutionary Council and State Peace and Development Council (SPDC), various development activities such as building roads and bridges, construction of the dams and establishing the model villages were carried out in this area. Accordingly, to be able to observe the remarkable changes from 1962 through this time of the State Peace and Development Council (SPDC), and to study the adaptability of the community were observed in three categories namely:

- 1) the villages situated near the dam ,
- 2) the villages where another nationals are living,
- 3) the village developed without moving to another place.

We need to organize people to observe and examine these complicated problems of environment. We also need rules and regulations to safeguard our environment. Besides, man and the environment are inseparable, so man should

always observe the condition of his environment for his long-term survival (Nanda, 1999). Research should be done on stability, modernity and education from the point of view of anthropology. The findings should widely be published to educate people. In this study, Gangaw Township is considered an appropriate site to perform this kind of research. Nevertheless, for certain parts of the data, the scope was uneven in detail, it is considered, however, has enable the reconstruction of environmental transformations during 1962 to 2010.

1.4 Aim and objectives

The aims of this study are as follows:

- to be able to link the natural environmental factors with socio-cultural system of the people in Gangaw Township;
- to explore the socio-cultural stability, modernity and education in the study area.

The specific objectives are;

- to elicit information on how the environmental changes and cultural ways of life are interrelated in the study area;
- to identify the adaptive strategies of the local people in the study area on the environmental changes;
- to make recommendations as regards how the positive aspect of indigenous culture should be maintained.

1.5 Conceptual framework

Adaptation is influenced by physical, biological, and behavior factors. Adaptation and the behaviour of individuals and social group are interrelated in complex ways. It suggests that adaptation is influenced by five sets of variables namely:

- (a) Behaviour Adaptation
- (b) Individual Adaptation
- (c) Primary Socio-cultural System
- (d) Secondary Socio-cultural System (Internal Adaptation)
- (e) Physical and Biological Environment (External Adaptation)

(see Figure 1.1: The conceptual framework)

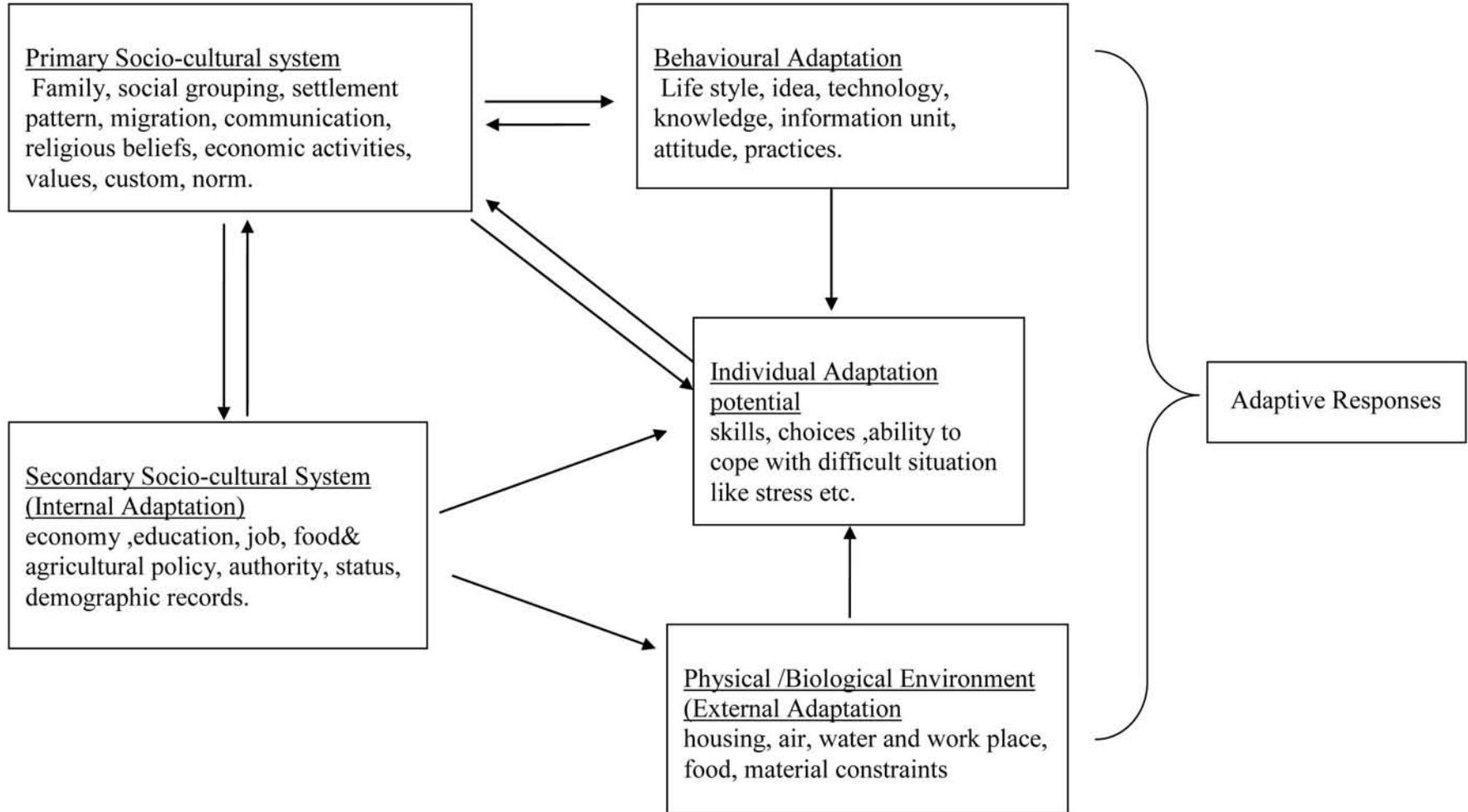


Figure (1.1): Factors influencing adaptive responses

1.6 Composition of the study

There are altogether eight chapters in this study. Chapter I is the introduction and chapter II is the literature review. Cultural ecological approach was used to describe this paper. As this study is also based on the cultural material, the economic, social and cultural changes caused by the social organizational development, the improvement of the infrastructure such as roads, bridges, communication facilities, and media of the local communities from both emic and etic point of views are observed. In chapter III, research methodology, the design of Ethnographic research, like qualitative research, depends heavily on the specific objectives of this paper. While they clearly do not exhaust the full range of field methods that might be drawn upon, particular emphasis on the use of ethnographic observations, in-depth interviews, key informant interviews, focus group discussions, focus group interviews and participant observation will be placed.

In chapter IV, environment and population, it is stated that child mortality rate in the study area has increased due to abortive measures, traditional childbirth practices, and birth control activities. Now, systematic birth spacing practices have been carried out: generally taking only three children. Owing to systematic childbirth and vaccination by village doctors and midwives, child mortality rate has decreased, causing population growth regular. Bride price, a traditional custom in Gangaw region, becomes higher and higher, leading to late marriage for both males and females: and this is one of the reasons that hinder local people to over-population.

In chapter V, economic resources and subsistence patterns, intensive agriculture and the main occupation in the five study villages were observed. Of the five study villages, Taung Kin Yan village where the Taung Kin Yan dam is located and Myauk Kin Yan village have improved a lot in agriculture. Not only natural fertilizer but also chemical fertilizers, pesticides, herbicides have also been used. Though it is supposed that machines have been in use in agriculture, 70% of them has still been in use of cattle labour. As Shon Shi and Zahaw villages do not have government dams, villagers only depend on hand-dug dams. In Kyaw village, within the significant social and cultural attributes, the society has extended its traditional trading systems keeping abreast of international trading systems just like Mandalay and Yangon, networking necessary trading methods and resources. Retail sales, increase in labour charges, development of companies and boost in trading portfolio have resulted firmly

in higher standard of living in the field of economy. Fowls are mostly bred livestock in the region. They feed on worms and insects themselves in the house compound without having to buy fodder for them. They are also essential to be used in traditional religious offerings.

In chapter VI, social response to culture change, in line with the development of the locality, household income happens to increase and thus economic management becomes complicated. Good communication and transportation, boom in business portfolios, establishment of state high schools, and affiliated high schools in education sector are obvious development activities. After 2000, school enrollment rate and pass rate have decreased, showing a decrease in education. The reason is that there are a great deal of fields in the area where money can easily be made and another thing is the result of unemployment being committed to a large number of graduates. As the communication has developed in the region, the postal service and the telegraph have also developed. In addition, natural disasters such as floods and their consequences like losing human lives and animals and the destruction of belongings are effectively prevented.

In chapter VII, Discussion, cultural ecological approach was used in carrying out the research: A case study of Gangaw Township, in Myanmar. It was to observe the infrastructure, structure and superstructure in Gangaw Township. In doing so, both emic (native's point of view) and etic (observer's point of view) were included through using the methods of functionalism (functions interrelating with each other) and comparism (comparing among five study villages) and cultural materialism (A research strategy that focuses on technoenvironmental and economic factors as key determinants in sociocultural evolution). Chapter VIII is the recommendations.

CHAPTER (2)

LITERATURE REVIEW: ECOLOGICAL APPROACH TO CULTURE

2.1 Cultural ecology

Ecology is the study of the interaction between living things and their environment. Human ecology is the study of the relationships and interactions among humans, their biology, their cultures, and their physical environments. The term provides the title of Human Ecology, a leading journal in the field. Human ecology includes ecological anthropology (which includes a great deal of biological anthropology) and environmental anthropology (a more "cultural" or humanistic side of the field).

Human ecologists study many aspects of culture and environment; including how and why cultures do, what they do to solve their subsistence problems, how groups of people understand their environment, and how they share their knowledge of the environment. The broad field of human ecology includes two major subdivisions (see Figure-2.1). Human biological ecology is the study of the biological aspect of the human/ environment relationship, and cultural ecology is the study of the ways in which culture is used by people to adapt to their environment (Sutton, Mark Q and Anderson.E.N, 2010).

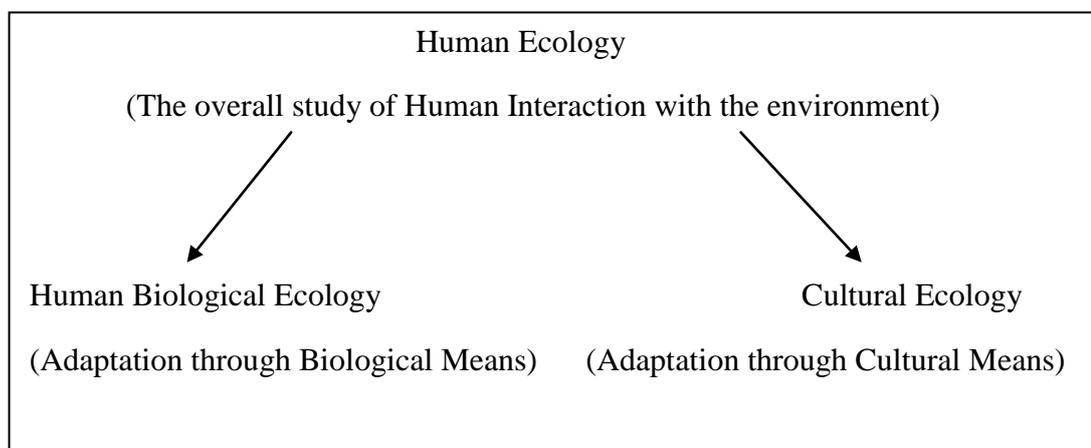


Figure-2.1: The general relationship of the major subdivisions within human ecology

Cultural ecology is the systemic study of the relationship between the environment and society. Anthropologists recognize that humans can adjust in extremely creative

ways to different environments. Nevertheless, humans, like other organisms, are connected to the environment in a number of ways. Just as the environment has an impact on human behavior and society, humans have a major impact on their environment. Modern Cultural ecologists examine these dynamic interrelationships as a means of understanding different societies (Scupin, Raymond 1998).

Serena Nanda (1999) described that an ecological approach to culture sees cultural patterns as adaptive responses to the basic problems of survival and reproduction. Cultural ecology makes a very important contribution to our understanding of relationship of human populations to their physical and social environments and it is one of the dominant approaches in contemporary anthropology.

Steward's cultural ecology framework divides socio-cultural systems into two different spheres: the culture core and secondary features. The culture core consists of those elements most closely related to subsistence – the environment, technology, and economic arrangements. The other characteristics, such as social organization, politics, and religion, constitute secondary features of society.

Steward's theories (1955) are presently regarded as examples of specific evolution, where cross-cultural regularities exist due to the presence of similar environments. Steward also specifies three steps in the investigation of the cultural ecology of a society: (1) describing the natural resources and the technology used to extract and process them; (2) outlining the social organization of work for these subsistence and economic activities; (3) tracing the influence of these two phenomena on other aspects of culture. ([Http// www. as.edu/ant/Faculty/murphy/ecologic.htm.](http://www.as.edu/ant/Faculty/murphy/ecologic.htm))

Raymond Scupin (1998) illustrated that Steward was instrumental in establishing the field of Cultural ecology. Also called ecological anthropology, Cultural ecology stresses the interrelationship among the natural conditions in the environment—rainfall, temperature, soils and technology, social organization, and attitudes within a particular socio-cultural system. Steward focused on how specific socio-cultural systems adapt to environment conditions.

Jerry D.Morre (2004) also illustrated that Steward considered the relationship between human society and environment and it focused on social-changes through time. Emilio F.Moran (1998) also mentioned that the "cultural ecological" approach proposed by Steward involved both a problem and a method. The problem was to test whether the adjustment of human societies to their environments required specific

types of behaviour or whether there is considerable latitude in human responses. The method involved three procedures: a) to analyze the relationship between subsistence system and environment: b) to analyze the behaviour patterns associated with a given subsistence technology: and c) to ascertain the extent to which the behaviour pattern entailed in a given subsistence system affected other aspect of culture. Steward's use of functionalism was concerned with the operation of a variable in relation to a limited set of variables, not in relation to the entire social system, and thus did not fall prey to the weaknesses of the current British functionalism. British Functionalists emphasized the role of social institutions in the maintenance of structural equilibrium. Steward steered "cultural ecology" towards a concern with how single systems change through time and how the causal relationships within that system can actually lead to change.

Ecological knowledge as studied by ethnoecology (an approach that focuses on the conceptions of ecological relationships held by a people or a culture), may be considered a subset of ethnoscience (folk science), defined by Hardesty (1977), as "the study of systems of knowledge developed by a given culture to classify the objects, activities, and events of its universe" (Inglis, Julian T, 1993).

The ecological focus of cultural materialism is on how humans make a living and manage to reproduce the next generation. The logic is similar to that of Julian Steward(1955), whose concept of the " culture core" (aspects of culture " most closely related to subsistence") suggests that what really matters in human affairs, from a theoretical standpoint, is how people solve the problems of survival that face all living beings. Plants and animals require nutriment, defense from predators, and means of reproduction. Humans are no exception, and, in Harris's view, many of their most interesting behaviours can be understood as solutions to the problems of maintaining material existence (Harris, 2001).

Harris (1979) described cultural materialism as the socio-cultural analogue of Darwinian selection and immediately identifies it as nonidealist and evolutionary. Harris will develop the principle of techno-environmental and techno-economic determinism. This principle holds that similar technologies applied to similar environments tend to produce similar arrangements of labor in production and distribution, and that these in turn call forth similar kinds of social groupings, which justify and co- ordinate their activities by means of similar systems of values and beliefs. Translated into a research strategy, the principle of techno-environmental,

techno-economic determinism assigns priority to the study of the material conditions of socio-cultural life, much as the principle of natural selection assigns priority to the study of differential reproductive success. Harris asserted we must make two sets of distinctions: first, the distinction between mental and behavioral events, and second, between emic and etic events. Behavioural events are simply all the body motions and environmental effects produced by such motions, large and small, of all the human beings who ever lived. Mental events, on the other hand, are all the thoughts and feelings that we humans experience within our minds. The second set of distinctions is between emic and etic. Emic perspectives convey a participant's point of view; etic perspectives are from an observer's point of view. These two ways of knowing imply different research approaches and agendas:

Emic operations have as their hallmark the elevation of the native informant to the status of ultimate judge of the adequacy of the observer's descriptions and analyses. The test of the adequacy of emic analyses is their ability to generate statements the native accepts as real, meaningful or appropriate.

Etic operations have as their hallmark the elevation of observers to the status of ultimate judges of the categories and concepts used in descriptions and analyses. The test of the adequacy of etic accounts is simply their ability to generate scientifically productive theories about the causes of socio-cultural differences and similarities. Rather than employ concepts that are necessarily real, meaningful, and appropriate from the native's point of view, the observer is free to use alien categories and rules derived from the data language of science. Frequently, etic operations involve the measurement and juxtaposition of activities and events that native informants may find inappropriate or meaningless.

These distinctions lead to specific categories of human actions and thoughts. First are those relating to the needs of meeting subsistence requirements, the etic behavioural mode of production? Second are the actions taken to ensure the existence of the population, the etic behavioural mode of production? Third are action taken by each society to maintain secure and orderly behavioural relationships among its constituent groups and with other societies, and because this is a principal area of discord, an associated set of behaviour are the economic processes which allocate labor and the material products of labor to individuals and groups. Therefore, we are concerned with the etic behavioural domestic economies and etic behavioural political economies. A final etic category, behavioural superstructure, consists of acts related

to the importance of symbolic processes for the human psyche--from art to advertising and from ritual to sport. Harris then lumps, for no clear reason, modes of production and reproduction under the rubric infrastructure and domestic and political economies under the name structure. When behavioural super-structure is added to these two categories, a tripartite scheme of etic behaviour emerges; infrastructure, structure and superstructure (Harris, Marvin, 1979).

Infrastructure is the principal interface between culture and nature, the boundary across which the ecological, chemical, and physical restraints to which human action is subject interact with the principal socio-cultural practices aimed at overcoming or modifying those restraints.

Harris argued that studies focused on infrastructure have a ' strategic priority for anthropological research (and finding), justifying this claim on two points. First, if the goal of science is to create an ordered body of knowledge based on law like generalization, then one should begin with those socio-cultural arenas under the greatest direct restraints from the givens of nature. Second, innovations in infrastructure tend to produce greater systemic changes since their reverberations are felt in the other arenas of structure: superstructure and mental emic superstructure. This does not mean that structure and superstructure are insignificant, epiphenomenal reflexes of infrastructure forces. Rather, such dimensions often serve as regulating mechanisms that may counteract changes or enhance and amplify them.

Innovations, Harris wrote, are unlikely to be propagated and amplified if they are functionally incompatible with the existing modes of production and reproduction--more unlikely than in the reverse this is what cultural materialists mean when they say that in the long run and in the largest number of cases, etic behavioural infrastructure determines the nature of structure and superstructure.

In short, understanding cultural patterns first requires explaining phenomena in terms of infrastructure--the culture/nature interface, as expressed by such dimensions as subsistence, settlement, population, demography, and so on -- and then understanding how such changes reshape structure and superstructure (Harris, Marvin, 1979). In this study, it is therefore to study the socio-cultural development situations in Gangaw Township regarding the changes in socio-cultural stability, economic stability based on technology and knowledge.

2.2 Evolutionary adaptation

The adaptation process establishes a moving balance between the needs of a population and the potential of its environment (Harveland, William A, 1981). Harveland (1999) illustrated that many different societies develop independently, and some find similar solutions to similar problems. For example, another group that moved out onto the Great Plains and took up a form of Plain Indian culture similar in many ways to that of the Comanche were the Cheyenne. Yet their cultural background was quite different; formerly, they were settled farmers with social, political, and religious institutions quite different from those of the Comanche back in their ancestral homeland. The development of similar cultural adaptations to similar environmental conditions by peoples of quite different cultural backgrounds is called convergent evolution.

Somewhat similar to the phenomenon of convergent evolution is parallel evolution, the difference being that similar adaptations are achieved by peoples of somewhat similar cultural backgrounds. To a large extent, the rise of great civilizations in such widely separated areas as China, northwest Mesopotamia, and Peru was made possible by the apparent independent invention of irrigation agriculture in each of these areas. The problems of applying independent invention of irrigation agriculture have in each of these areas. The problems of applying irrigation agriculture to making a living in riverine environments – problems of labor and distribution – played an important role in the development of a number of parallels in the social and cultural development of those societies.

2.3 Cultural adaptation

Adaptation is the long-term cultural process of maintaining a balance between population and natural resources within a given environment. It is a two-way process, a group may change its strategies or tools in order or make better use of a particular environment, or it may change its environment by moving away altogether. However, groups may interact with the environment to change it. Thus, cultural ecologists study the effects that human groups have on their environment as well as the ways they adapt to it. (Revision Notes.Co.UK, 2.4.09, Cultural Ecology and Environmentalism, <http://www.revision-notes.co.uk/revision/593.html>).

Donald L. Hardesty (1977) showed that adaptation is the central concept in ecological studies because it is the process whereby beneficial organism/ environment relationships are established. Moreover, Donald L. Hardesty illustrated that Alland (1970) suggests there are really two kinds of adaptation: external and internal. External adaptation is the process of making beneficial adjustments to the environment, while internal adaptation is the process of beneficial compensation for those adjustments within the organism or other system. The problems of internal adaptation must be solved before further change can take place.

Cultural adaptation can occur much more rapidly because culture is learned behavior. The relative rapidity with whom human beings can respond to changing environment gives them a high degree of adaptation advantage (Nanda, Serena, 1990). Jerry D. Moore (2004) described that Steward analyzes adaptation to the complex interconnections that make up an environment; cultural ecology is a view of man in the web of life. That web consisted of both natural and cultural realities:

It distinguishes different kinds of socio-cultural systems and institutions; it recognizes both cooperation and competition as processes of interaction and it postulates that environmental adaptations depend on the technology, needs and structure of the society and on the nature of the environment. It includes analysis of adaptation to the social environment.

The Hindu taboo on eating beef despite widespread poverty and periodic famine in India seems ridiculous to westerners. Yet, according to Harris (1964), it does make adaptive sense. Cows are important in India not because they can be eaten but because they provide dung for fertilizer and bullocks, the draft animals that pull plows and carts are essential for agriculture. If a family had to eat its cows during a famine, it would deprive itself of the source of bullocks and could not continue farming. The religious taboo on eating beef thus strengthens the ability of the society to maintain itself in the long run.

Cultural materialists hold that this task can be carried out by studying the material constraints to which human existence is subjected. These constraints arise from the need to produce food, shelter, tools, and machines, and to reproduce human populations within environmental and biological limits. Cultural materialists see both the mental and the spiritual aspects of human life – values, religion, and art – as varying on accordance with the material constraints on a human society. For cultural

materialists, both ideology and social organization are adaptive responses to the material constraints on a culture.

In emphasizing the adaptive nature of different aspects of a socio-cultural system, cultural ecologists and cultural materialists have been able to show that beliefs and practices that seem irrational to outsiders may still result in national utilization of the environment, given a certain level of technology.

Bamar (Yaw) nationals and Chin nationals have been living in Gangaw Township. Chin nationals spread all over Chin Hill and Pondaung Pongnya mountain ranges. The main problem of the region is that it needs to depend on rainfall to grow crops as there is the scarcity of water. To solve the very problem, dams are to be constructed by blocking rivers and streams. Owing to the existence of the development of similar adaptation to similar environmental conditions by similar cultural background, it is to make the study based on parallel adaptation.

2.4 Ecology and social organization

Mauss (1979) and Steward share views of the relation between social organization and ecology that are far more complex than earlier environmental determinism, as we will see. They also share evolutionary concerns; essentially they are interested in the simplest social organizations and the most demanding environments, in order to understand how environment might have shaped early societies.

Alfred F. Kroeber (1963) says that "culture can be understood primarily only in terms of cultural factors", but that "no culture is wholly intelligible without reference to the environment factors with which it is in relation". He says that cultures are necessarily adapted to a particular environment and that once this adaptation has occurred they tend to change slowly. Kroeber, best known for the idea of the culture area, documented correlations between cultural areas and natural areas in North America. Kroeber did not theorize beyond these specific correlations, however, declaring that "the interaction of culture and environment" are exceedingly complex", making generalization unprofitable".

Murphy, Robert F (1977) illustrated that Steward focused on the organization of subsistence production, which he viewed as "cultural ecological adaptations". Work in its fullest sense, and particularly including how labour is organized, thus stands between the environment and social organization. Moreover, work could distance

culture from nature, allowing culture to rise above nature: Steward hypothesized that as subsistence problems were solved, "the effect of ecology becomes more difficult to ascertain".

For Steward the Shoshone were an ideal case for clarifying the limiting effect of ecology on work and thus social organization:

"Shoshonean society was effected not only by the erratic and unpredictable occurrence of practically all principal foods (ecology) and by the limited technical skills for harvesting and storing most of them (technology), but it was also shaped by the predominant importance of wild vegetable products, which put a premium upon family separatism rather than upon co-operation (organization of labour)".

Steward's focus on environmental adaptation is not environmental determinism because the economic exploitation of the environment and the organization of production are inserted between nature and culture. Michael R .Dave and Carol Carpenter (2008) described that Mauss and Steward rejected environmental determinism, but in quite different ways. Steward focused on how work, especially the social organization of labour was shaped by or adapted to ecology. This focus gives environmental influences an indirect but essential role. Mauss, in contrast, gives the environment a much more limited role: that of providing the opportunity for the creation of social wholes, which were actually created by culture, especially religious practices.

Both Mauss and Steward chose to examine the issue of the influence of nature on the organization of human society primarily in relation to hunting and gathering (or foraging) societies rather than cultivating ones. It is interesting to consider that foragers raise the question of nature's impact on culture, while swidden farmers raise the opposite question, of culture's impact on nature.

The emphasis of this study has been put on the advantages and disadvantages caused by the better transportation and communication owing to road and railway construction, and agricultural development because of irrigation after the construction of dam in the Gangaw region where transportation and communication were once quite hard in those days. Along with these developments in the area, such changes as the emergence of social organization, cultural influences, migration from other localities due to the attraction of job opportunities, education of the youths, and

utilization of natural resources have taken place. It is thus to observe the relationship between the impact of culture on nature and the impact of nature on culture reflecting the adaptation of the local people in line with the environment and social changes of the region.

2.5 Environment, subsistence and demography

Raymond Scupin (1998) mentioned that demographic anthropologists study the relationship between environments (specific biomes) and population. One variable they investigate is carrying capacity, the maximum population that a specific environment can support. This concept refers to the environment's potential energy and food resources that can be used to support a certain number of people. Some environments contain food and energy resources that allow for substantial population increases, whereas other environments contain only limited resources. Thus, population growth leads to an increased risk of shortages of food and other resources. To maintain adequate resources, these societies give certain individuals the power to organize systematically the production and accumulation of surplus resources.

Demographic anthropologists examine not only the relationship between environment and population but also cultural values and practices that affect fertility, mortality, and migration rates. In others, political authorities institute programs to increase or decrease population growth. One recent area of anthropological research involves gathering data and developing hypotheses on decisions concerning the costs and benefits of having children and the consequences of these individual decisions on fertility. Anthropologists also investigate strategies of population regulation, such as birth control techniques (Scupin, Raymond, 1998).

The local breeding population is often equivalent to a human settlement, for example, a camp, village, or town, it can be easily identified and described. Furthermore, the local community is often integrated by kinship, social, economic, and political ties into an effective adaptive organization. However, the local breeding population is not always the appropriate unit. The effective ecological population is often a vast network of local groups integrated by economic, social, and political ties (Hawley, 1973).

If the concept of the breeding population is appropriate, boundaries can be defined by geographical patterns of marriage. The geographical region within which marriage

partners found and reproduction takes place defines the gene pool boundaries as well. Marriage patterns have a geographical distribution determined by (1) marital movement, any geographical movement involved in the selection of mates; (2) post marital movement, the geographical movement determining where reproduction takes place after marriage; and (3) parent/offspring movement, the total movement involved in the selection of mates and reproduction (the combined marital and post marital movement). Marital and post marital movement can be measured by several indices developed by anthropological demographers. Marital distance, the distance between the birthplaces of the marriage partners, is calculated by averaging the distances between the birthplaces of all marriage partners (Harrison, G.A and Boyce, A.J, 1972). It would seem obvious that a large population has solved the problems of survival better than a small one. Yet population size or density cannot be used as a measure of adaptation without qualification since, for one reason, abundance is subject to drastic change over time. A large population may be able to exist only temporarily, crashing to a much smaller size in the long run because it has overexploited food resources, has been wiped out by an epidemic disease, or has violated some other ecological limit (Hardesty, Donald L, 1977). Apart from its use as a measure of human adaptation, anthropologists have been interested in population abundance as a possible cause of diversity in social organization. Julian Steward was probably the first to see a relationship between kinship and population size.

They are better defined as categories combining kin relationships for several purposes, including marriage, ritual, and subsistence. In addition, sections have territorial boundaries corresponding to the boundaries of the local groups included in each section. The number of sections included in a marriage system then, is simultaneously a measure of the number of eligible mates, the number of local groups with which one has kinship connections, and the geographical extent of one's kinship connections.

Raymond Scupin (2000) illustrated that after the transition to intensive agriculture, population began to increase dramatically along with increases in agricultural production, enabling people to settle in large urban areas. These population increases produced conditions that led to higher mortality rates. Despite increased mortality rates and decreased life expectancy, populations continued to grow at a significant rate because of increased fertility rates. Undoubtedly, higher birthrates reflected the socioeconomic benefits associated with increased family size in agricultural

civilizations. Children provided additional labour for essential agricultural tasks such as planting, caring for animals, and harvesting, thereby freeing adults for other labor such as processing food and making clothing. The actual costs of rearing children were relatively low in agricultural states in which increased agricultural yields produced surplus foods to support large families. Clothing and shelter were manufactured domestically and were therefore inexpensive.

In addition, the mortality rates, particularly infant mortality rates, encouraged parents to have more children to ensure that some would survive into adulthood. Moreover, children were viewed as future assets who could take care of their parents in later life. In addition to the socioeconomic motives of parents, the political dynamics in agricultural civilizations encouraged high fertility rates. All of the agricultural states promoted the ideal of having large families (Harris & Ross, 1987). These societies depended on a large labour force to maintain their extensive agricultural production and military operations. Policies favoring high birthrates frequently were backed up by religious ideologies.

A fundamental study by Raul Naroll (1956) investigated the relationship between complexity in social organization and population size. Population size is measured by the number of people in the most populous building cluster of the ethnic unit studied (Naroll, 1956). The number of occupations, measured by the number of craft specializations, is used as one indicator of complexity in social organization. Complexity is also measured by the number of social units that link together individuals into an interdependent, symbiotic network. Each social unit is called a team and is defined as a group of at least three people with clearly defined membership and formal leadership in regular use. In effect, these two indicators of complexity measure the degree of functional specialization and the degree of symbolization. Naroll concludes from this study that there is a general trend toward increasing specialization and symbolization in social organization as population size increases.

The ecological population of this region is to be observed based on economic, social and cultural backgrounds practised by the local people. Such fundamental linkages as the migration from other localities after the development of intensive agriculture, utilization of birth control techniques, and birth constraints caused by late marriage due to high bride price reflected in marriage system are to be included in the investigation.

2.6 The influence of culture on environment

Nanda (1995) illustrated that the relationship between the environment and culture is not one-way. Although, as just suggested, the environment affects culture, culture also affects the environment. The ways in which people get food and the ways in which they live all have an impact on nature. On the one hand, technology and knowledge can transform deserts into gardens. On the other hand, as we know all too well today, the presence of human populations can have a devastating impact on nature. In industrial societies, factories and automobiles have contributed to polluting the air we breathe. Different methods of getting food, whether hunting, trapping animals, cultivation, or keeping herds of livestock, all affect animal and plant life, quantity of natural resources, the soil cover and the soil itself. The management of resources is clearly a pressing problem in the world today. One of the contributions of ecologically oriented anthropologists is to show that a wide variety of food-getting strategies makes good ecological sense and that what may at first appear to be a more efficient exploitation of a particular environment may turn out to raise as many problems as it solves.

2.6.1 Major food-getting patterns

There are five basic patterns of utilizing the environment to support human populations (Cohen, Yehudi,ed, 1971): hunting and gathering, pastoralism, extensive cultivation, intensive cultivation, and industrialization. Although it is useful to describe basic type, there is a great deal of diversity within each type. Furthermore, any particular society normally has one dominant way of utilizing the environment, but most actually uses a combination of patterns in filling their needs. Each type of adaptation has a characteristic level of productivity (yield per person per unit of land) and efficiency (yield per person per hour of labour invested), though situations vary depending on the particular ecological interaction. Each type of food-getting pattern also seems to have some social correlates (accompanying forms of social organization) and dominant values, though again, many anthropologists are more interested in examining specific cultural adaptations to a particular local environment than in formulating cultural typologies.

Flannery (1972) pointed out that human beings have long depended on natural vegetation and wildlife from aeons ago. Gradually, agriculture, a strategy that led them to adapt a settled human society, was introduced, forcing them to abandon their primitive life style of wandering and hunting. The new economic life demanded a great deal of human labor, producing crops and food for human consumption, and trying to make progress in those fields. For example, man makes many loaves of bread from wheat. They depend on breeding instead of hunting. The result of this commitment is changing all other things: the decrease in depending on natural resources, highlighting on land ownership, political complexities, specialization, etc.

2.6.2 Irrigated agriculture

Victor T. King and William D. Wilder (2006) described that in irrigated rice cultivation it is the supply and control of water (its level and timing) which play a crucial role, protecting the soil, bringing nutrients onto the fields, encouraging the activity of nitrogen fixing organisms and the decomposition of organic material, and the aeration of the soil. Maintaining a uniform level of water on the field by leveling the land, constructing embankments or bunds and terraces, and regulating the water by a system of irrigation and drainage channels are therefore essential.

An important characteristic of irrigated agriculture on the other hand is that the regulation of water demands a substantial resource of labour, in constructing and maintaining waterworks as well as in preparing fields for cultivation. In addition, water control systems and their maintenance require cooperation between farmers as do the demands on labour at peak times of the year such as at harvesting. In response to the need for increased production wet rice farmers in South-East Asia have also tended to prefer to cultivate existing fields more intensively rather than invest a large amount of additional labour in constructing new fields and increasing the irrigated area.

What is clear is that irrigation is closely related to labour-intensive methods of cultivation and "the intensification of rice-farming both permits and requires demographic increase". Yet in spite of suitability of wet rice cultivation for small-scale farming and investment in labour, technological innovations have been introduced recently, especially in the context of the "Green Revolution". It is worth dwelling briefly on some of the changes which have been introduced to demonstrate

the application of vie and improved technologies to irrigated agriculture and the dramatic increase in rice yields. As Geetz's (1963) study demonstrates, the cultivation of wet rice is capable of absorbing a large amount of labour, particularly in such processes as land preparation, transplanting, harvesting and threshing. But, with the rise of tractors for ploughing the land and combine-harvesters for reaping and threshing, a large part of the labour needs was removed.

Geddes, Bill, Hughes, Jenny and Remenyi, Joe (1994) mentioned that intensive farming, in which land is not left fallow for a period but is continually used, requires the land to be rejuvenated by the application of a range of fertilisers, by improved irrigation practices, and by the rotation of crops (of course, extensive agriculture also makes use of crop rotation and companion planting to maintain the quality of soils).

Sutton and Anderson (2010) illustrated that the essence of this intensive agriculture is farming and animal breeding, often producing spare parts, distribution of water through animal labor and tools. Intensive agriculture represents significant change of technology in farming. It reflects the fundamental change between man and its environment. Though intensive agriculture has an enormous dependency on the sole labor of men, the use of animal labor and machines is quite obvious.

The change of technology in the field of intensive agriculture and the combination of social and technical aspects are the development of alternatives in line with the environmental situations. The intensive agricultural system is based on horticulture and animal breeding to some extent, strengthening production and taking risks, and using other food production tactics. It also includes hunting, horticulture and animal breeding. One of the facts that drive intensive agriculture to produce more commodities is due to the large intensity of transportation by men and the increase in population. Population explosion may cause political intricacies, causing less movement and encouraging settlement including increase in population and state development impacts.

Raymond Scupin (1998) illustrated that when we hear the technology we usually think of tools, machines, clothing, shelter, and other such objects. As defined by modern anthropologists, however, technology consists of all the human techniques and methods of reaching a specific subsistence goal or of modifying or controlling the natural environment. Technology consists not merely of physical tools but also of cultural knowledge that humans can apply in specific ways. In societies in which people use technologies such as bows and arrows, canoes, plows, penicillin, or

computers, the cultural knowledge needed to construct, design, and use these materials is extremely important.

To sustain life, human societies need to produce and allocate goods and services to provide food, clothing, shelter, tools, and transportation. Goods are elements of material culture produced from raw materials in the natural environment, ranging from the basic commodities for survival to luxury items. The commodities for survival may include axes and plows for clearing land and cultivating crops.

2.7 The social environment and cultural response

Due to climatic variation, food resources vary in availability and abundance at different times of the year in any particular local environment. Many aspects of a food-production system will reflect this seasonal variation. Nanda (1995) mentioned that socio-cultural systems also develop in response to variations that are unpredictable over the short run – such as drought, floods, or diseases that affect animals but that are a persistent part of the environment over the long run. Subsistence patterns most directly reflect adaptation to long-run environmental uncertainty. Food habits and preferences, for example, can be adapted to a wide variety of resources, rather than being limited to resources that are not so readily available.

A group can also structure its diet so that, although it uses a wide variety of resources, it also has one that is dependable, that is, in constant abundant supply. In addition to these more obvious ways of adapting to environmental uncertainty, a society can establish trade relations with other groups and thus expand its resource base. Although increasing technological efficiency is an obvious way of increasing control over the environment, the enormous diversity of socio-cultural systems is evidence that technologically simple societies have been able to make satisfactory adaptations even without modern science.

Nanda (1995) described that cultural patterns, including how people get their food, are adjusted to the presence of different groups in the environment. Some peoples who originally inhabited a larger area, like the Semai of Malaysia, have recently been pushed back by other groups into marginal areas and have had to change their subsistence patterns. Human groups (like other animal communities) tend to engage in specialized adaptations to the environment that, over time, become integrated in their

cultural systems and are an important part of their identity. A specialized adaptation to a local environment by a particular group is called its niche.

Frederik Barth (1956) describes a pattern of social interaction in Pakistan in which three ethnic groups, the Kohistanis, the Pathans, and the Gujars, have a different niche within the same mountainous area. They are able to live peacefully because each group exploits a different aspect of the environment. The Pathans are farmers, utilizing the valley regions for raising wheat, corn, and rice. The Kohistanis live in the colder mountainous regions, herding sheep, goats, cattle, and water buffalo and raising millet and corn. The Gujars are full-time herders and utilize marginal areas not used by the Kohistanis. The Gujars provide milk and meat products to the Pathan farmers and also work as agricultural laborers during the busy seasons. Such patterns of specialized and noncompetitive interactions among cultures in a local environment are found in many parts of the world. In the study area of Gangaw, Bamar (Yaw) nationals and Chin nationals live together. 90% of the Chin nationals have the same niche as they live in the same mountainous area involving in the intensive agriculture. For the 10% of the Chin nationals, it is to be stated that they have different niche because although they live in the same mountainous area, they make their living through such extensive agriculture as growing pigeon pea, and hunting.

2.7.1 The cultural ecology of households

The households are a problem for anthropologists for a number of reasons, historical, sociological and intellectual. Our most glaring failure is the comparative study of household budgets, including the follow up resources and decisions about how to allocate and consume them (Morgan, Emilio, 1998). A number of authors have focused attention on the structural problems that households face in combining subsistence production with market- oriented farming or wage labor. World systems theorists have recently focused on the household as the crucial social unit where pooling of different forms of income from household and on household production reproduces labor. Recent Marxist and feminist literature gives a great deal of attention to the division of labor within the household, and to the ways that power and production roles change during proletarianization. Yet others have looked at the changing economic basis of power and inequality in the household (Morgan, Emilio, 1998).

As Laslett (1984) and Sahlins (1972) point out, there is no society in which households are totally isolated and self-sufficient. Households are always connected to each other, and penetrated by other affiliations through age, kinship, gender and class. We need to see the household as social relations and practices that integrate a number of functions and activities, distributing the products of labor, and allocating work and resources. A focus on integrative activities, on the ways that things are shared, and the ways decisions are made, is logically inseparable from the issue of household boundaries.

The inner workings of the household have not been completely ignored by ecological and economic anthropologists. Attention has been paid to the ways that the labor of the household members is managed and apportioned to various tasks, the ways that property and wealth are managed and transmitted between household members, the ways that food is apportioned among members for consumption, and the ways that rights to the use of household resources are divided between members (McMillan, Della, 1986).

In particular, the daily livelihood activities and interactions that are the habits of the household is determined in the family by power and resources within ecosystems relating to study capabilities on plants, creatures and their relating ecology.

Economic change leads to alterations in boundaries, in the economic bargains and balances between household members, in the allocation of labor and resources to different funds, and in the economic roles taken by different funds, and in the economic roles taken by different people. By adding this kind of analysis to existing studies of household decision-making, households are seen to do much more than passively adapt to changing environments (Moran, Emilio, 1998).

One part of the problem is that money, labor, and food are not equivalent within the household economy (Wilk 1989, Maher 1981). As the cultural definitions of costs and benefits change, the balances and bargains that underlie the household economy are also changing. Monetary values have certainly penetrated some households more quickly and deeply than others. A crucial event is often seen when sons who still live in the household take wage-earning jobs. Parents must then decide how to treat those earnings, and reach some accommodations with the son about them. But even among the households where some members earn wages, there is a good deal of variation in how wages, income from crops sales, and subsistence production are pooled and managed.

Ecology also offers tools for describing discrete systems and the ways they interrelate, without obscuring the dynamic and changeable nature of those relationships. A common method is formal modeling, using a variety of graphic and statistical methods to simplify and represent the systems under study (Moran, Emilio, 1982).

2.7.2 The culture of the school

The culture of the school tends to be a middle class one although schools vary in their education objectives. Some schools will emphasize their 'academic' role and be concerned mainly with achievement. Some will concentrate on their pastoral role of developing personal qualities and some will strive mainly to keep a maximum of good order and discipline, their 'custodial' role (O'Donnell, Gerard, 1994).

Efforts to create effective classroom environments for children from diverse cultural backgrounds should be based, in part, on knowledge about the role that culture plays in shaping children's learning opportunities and experiences at school and within the classroom. Thus, as children come to school, they bring culturally informed knowledge, values, and skills to the classroom environment and rely on them as a reference for interpreting new experiences. All children enter the learning environment with this cultural capital (<http://www.as.ua.edu/ant/Faculty/Murphy/ecologic.htm>).

It is crucial, then, especially for teachers, to identify those aspects of children's cultural backgrounds that have the greatest relevance for children's adjustment, motivation and learning within the classroom. One of the challenges that this poses to educators involves striking a balance between demonstrating respect and understanding for culturally divergent students and preparing these students to participate successfully in formal school settings. A starting point for addressing this dilemma involves understanding how children's cultural backgrounds affect the skills, knowledge, and expectations that they bring to the classroom (<http://www.as.ua.edu/ant/Faculty/Murphy/ecologic.htm>).

2.7.3 The media and change

Gerard O'Donnell (1988) pointed out that Himmelweit (1958) considered the children most likely to be affected by televisions and they are least critical – in particular the less intelligent 13 to 14 year olds- it must be presumed that television has some

influence on tastes and opinions. However there is evidence that people in general tend to watch and read features that agree with their own views, or to interpret news and views through a mesh of previously received ideas. There is likely to be no sudden change in attitudes as a result of exposure to the media. However, there is what has been called the 'drip effect': constant repetition tends to familiarize us with the idea that certain types of behavior, perhaps violent or promiscuous, are normal.

It is also suggested that the media, like other institutions in Britain, are essentially conservative and are unlikely therefore to challenge accepted norms and values to any marked extent. Children who are drawn into delinquency are the result of an unsatisfactory home life and an environment within delinquency is a possible and even socially- accepted way out for frustrated youth. The supposition that they are perverted by the mass media alone is a gross oversimplification of a serious and complex problem. There are, or have been, horror comics and films which should not be shown to children, but to suggest that children have been turned into delinquents in this way is to put the cart before the horse, since it is those who continue to be attracted by such books and films that are showing the symptoms of potential delinquency. Horror stories are, indeed, a natural component of growing up, but few modern tales could be as horrific, offensive (e.g. in their anti-Semitism) and we have tried to show that similar horrific fantasies occur in all children whether or not they are exposed to stories, films, or plays about them.

Multi- national corporations in their products and advertising tend to project similar images in a variety of countries which may, in the long term, contribute to growing similarities between the countries concerned. Student exchanges and grant-aided study overseas has made possible a greater exchange of ideas between the future leaders of a variety of cultures. It is tempting to assume that the opening up of ideas between differing cultures will lead to greater tolerance but there is little sign of this. Without doubt a certain amount of terrorism has been imported and exported (O'Donnell, Gerard, 1994).

As this study is also based on the cultural material, the economic, social and cultural changes caused by the social organizational development, the improvement of the infrastructure such as roads, bridges, communication facilities, and media of the local communities from both emic and etic point of views are observed.

Moreover, the interrelated phenomena among culture, natural environment and social environment are also to be included in the study. It is therefore to identify the

adaptability of the Chin nationals and Bamar (Yaw) nationals who live in Gangaw Township to their natural environment through cultural approach. Some cultural heritage that still survives and some others totally disappeared are also to be pointed out. Vitor T.King and Willian D. Wider (2006) illustrated through cultural ecological approach that the shifting cultivation, one of the traditional economic sector in Kachin State, was based on extensive agriculture. This study however will present the adaptability of the local communities based on the intensive agriculture trying to develop the irrigated farming through building dams, and using modernized technology apart from animal labour. It is thus observed the situation of stability, modernity, and education of the region through cultural ecological approach.

CHAPTER (3)

RESEARCH METHODOLOGY

3.1 Study design

The design of Ethnographic research design, like qualitative research, depends heavily on the specific objectives of this study. A range of different methods is available and researchers need to formulate a strategy for implementing these methods according to the goals of this study and the setting of the research (Bernard, H. Ressel, 1988). The strategy for using different methods depends on target goals, and such strategizing may employ one or more particular methods, singly or in combination, according to these goals. As we have attempted to suggest in the preceding discussion, the study of Ecology Model raises a series of specific issues that are perhaps distinct from that would emerge in the study of other cultural domains.

With these issues in mind, a range of different qualitative research methods can be employed in the study of **the ecology model and on going process of culture change: A case study of Gangaw Township in Myanmar**. As described in the literature review, only a few strategies of people who live in Gangaw Township in Myanmar, involve in the emic or etic options.

3.2 Pilot survey

It is observed that Gangaw Township, Magway Region, has great a potential to be modernized. Communication and transportation in the region were once hard due to Pontaung-Ponnya mountain ranges. After the completion of Pale-Gangaw road in 1962, in the age of State Peace and Development Council, 1988, due to the construction of car roads and the establishment of dams, the situation of the region has much developed.

In consideration of the potentiality of cultural and social changes characterized by the environmental situation, the decision reached to choose the villages in Gangaw Township for the study. Accordingly, pilot survey was made in Gangaw in 2008– from July 23 up to 30. During pilot study (from 23.7.2008 to 30.7.2008), the observation was first carried out at the library (of the General Administration Department), Myitthar project implementation of the Irrigation Department, and the completion status of railroad construction. During those days, Key Informant Interview (KII) was conducted along with the three local nationals who are one

village elder and two heads of the households to find out the history of the region. On 26.7.2008, Structure Observation was carried out at Shon Shi village, and also a discussion with a Chin national key informant was observed.

Structure observation was made in Zahaw village on 27.7.2008. Due to heavy rain, such activities as book review on those collected and giving instructions to a note-taker were made on 28.7.2008. The note-taker is a graduate. She was practically trained during pilot survey, intending to make her participate in the FGIs and FGDs of the second and third field research. Field study to Zabei village and Panan village where Myitthar reservoir exists, giving practical training to the note taker, and observing (KII) with two informants taking 1–2 hours per head, both visual observation and structure observation were made on communications and transportation scenario, “the shrine for an Ahmayyeyin nat” and rainy season crops.

The villages—Zabei, Panan, Yinmar, Sinpon – which exist under the Myitthar project flooded (watershed) area were moved to Myauk Kin Yan village. After discussions between the villagers of the four villages and the local authorities, it was decided to move to Bodikonemyay (မောဝိကုန်းမြေ) near Myithar reservoir in 2007: the movement of some houses were being observed and decided to select and study Zabei and Panan villages. It was also decided to select Shon Shi and Zahaw villages as these villages stand near Gangaw and thus to be able to make comparative study on the cultural existence of Chin nationals and Bamar (Yaw) nationals.

Moreover, Kyaw village which stands on Monywa-Gangaw-Hakhar car road was also considered to be included in the study villages. Kyaw village, receiving great impact due to the establishment of railroad and car road, having a flux of migrated settlers owing to oil wells near the village, was finally decided to choose as a study village.

3.3 Study population

The entire Chin as well as the Bamar (Yaw) nationals in the five study villages were studied. Males and females over 18 years old for FGDs, and males and females over 12 years old for education sector, including local communities and migrants, were to be studied until data and information were gathered to full satisfaction.

3.4 Sampling of the study sites

Purposive sampling was conducted to select study sites. The sampling process is shown in Figure 3.1. Of the ten states and seven Regions in the country, Magwe Region was chosen. Magwe Region includes five Districts including Gangaw District. Gangaw District was started to form in 1996 (Gangaw District Gazetteer, 2003). The Gangaw District is administratively divided into three townships: Gangaw, Htilin and Saw. Gangaw Township (see Appendix-I) was chosen for my field area. In olden days, it was difficult to travel in this region because of the surrounding Pontaung and Ponnya mountain ranges. Today, the rural development activities such as building roads and bridges, constructing dams are being carried out. There are a lot of environmental changes. It was therefore chosen to study the cultural changes and adaptability of Gangaw Township, the research area. The population density of Gangaw Township is 149,000 per square mile. There are (110) villages in the township (see Figure-3.1). The majority of the populations are Buddhists. Characteristics were considered for sampling of study sites.

Shon Shi and Zahaw villages where other nationals are living were selected as study villages. Shon Shi village has a total population of 4467 in 2010 and Zahaw village of 2790 in 2010. Previously, Zabei and Panan villages were thought to be included in the study villages but the completion of the Myitthar reservoir project was quite far away (the estimated construction period: from 2002–03 to 2010–11) and so then two villages were omitted. Instead, Taung Kin Yan and Myauk Kin Yan villages where development of agriculture activities have been obvious by use of irrigated water from the Taung Kin Yan dam and railroads were successfully completed in 2009–10 when the first research work was conducted were selected. Taung Kin Yan village has a population of 3361 in 2010 and Myauk Kin Yan village has a population of 3862 in 2010.

Finally, Kyaw village which are developed without moving other place was selected. Kyaw village has a population of 1824 in 2010.

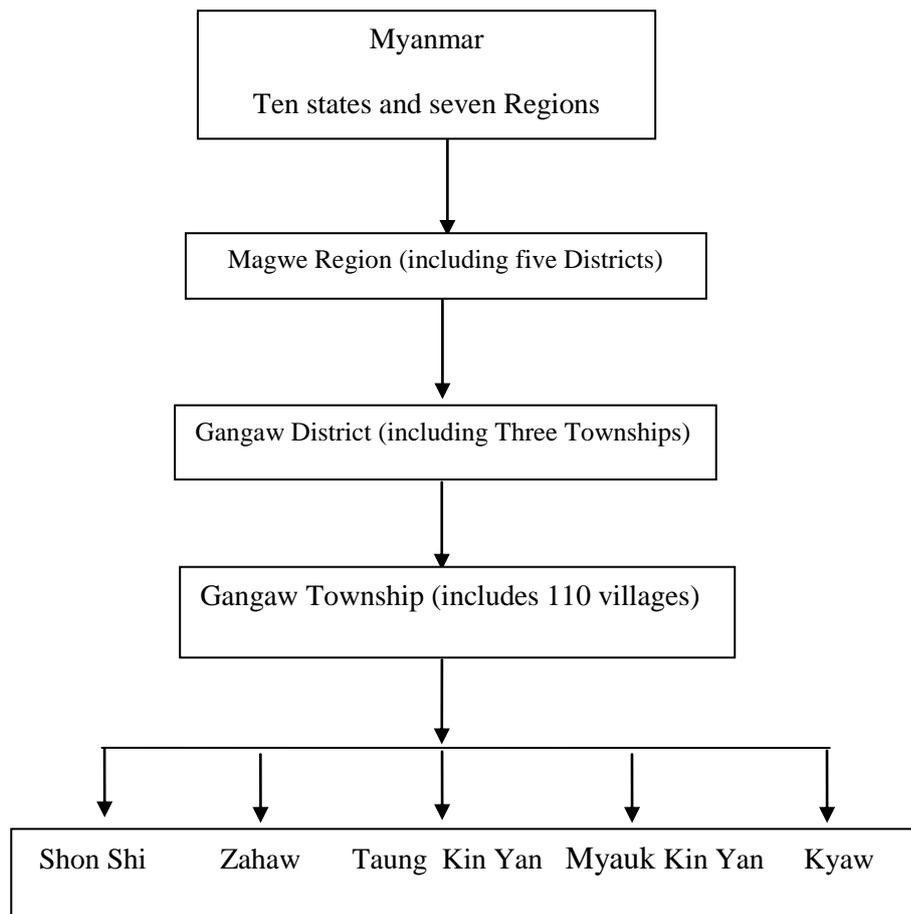


Figure-3.1: (5) Study villages

The establishment of model villages in Gangaw Township was initiated in 2001–02. Five year plan (from 2001–02 to 2005–06) to establish model villages in line with the 15 point criteria identified to have the same development level between rural and urban areas was drawn up. Altogether (11) model villages have been set up in Gangaw Township as per the “Gangaw District Gazetteer, 2003”. Of the selected five study villages, the three villages– Zahaw, Taung Kin Yan and Kyaw are model villages (see Table: 1).

Table-1: Three model villages as the selected study villages

No.	Model villages	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Zahaw	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	Taung Kin Yan	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	Kyaw	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Source: Gangaw District Gazette, 2007

1. Pagoda and monasteries
2. Village library
3. Play ground
4. Village common land area
5. Market
6. School
7. Rural Health Centre
8. Communication and transportation
9. Shady trees and woodlot
10. Village gate, Village hedge
11. Cemetery
12. Village Administration Office
13. Non-Governmental Organizations (NGOs)
14. Security: Fire, flood
15. Health, sanitation, fly proof latrine, environmental sanitation

* Accomplishment of activities

Shon Shi Village

Shon Shi village (see Figure-3.2) stands one mile in the north of Gangaw. As the Myitthar River (see Figure-3.3) flows between Shon Shi village and East Gangaw, a suspension bridge (700' in length) (see Figure-3.4) is to be used to cross the river. The bridge cannot be used by cars; only by motorcycles and bicycles. The word 'Shon Shi' derives from Chin language 'soms' (ဆမ်ဆီ) meaning 'unrivalled, being economical' (Yoan Maw, U, 1989). It now has the area of 0.08 square mile (51 acres). Chin and Bamar (Yaw) nationals live together in Shon Shi village; 90% of them are Chins, the majority of them are Buddhists.

Agriculture is their occupation with livestock breeding to some extent. Irrigated farms get water from village dams and private dams. Yaw traditional weaving is done by women. A few Chin nationals practice strap weaving (Gyatchode) (ဂျပ်နုတ်) for extra income for their families. Not the development market, the home shops sell vegetables and meat in the morning. Furthermore, parents and village authorities encourage education. Essay and poem contests are annually held on Sarsodaw Day (စာဆိုတော်နေ့). The pass rate of matriculation examination in 2010 was 33%: the

highest pass rate of the five study villages. Shon Shi is the village where educated persons emerge most. State High School, monastery, village administrative office, village library, NGOs, health, education and fly-proof latrines, environment sanitation all take place in Shon Shi village.



Figure- (3.2): Shon Shi Village
Source: Land Records Department, in Gangaw Township, 2012



Figure-(3.3): Myitthar River



Figure-(3.4): The Myitthar Suspension Bridge

Zhahw Village

Being situated on the bank of the Zahaw creek, Zahaw village (see Figure-3.5) is 1 ½ miles far away from Gangaw. It now has the area of 0.08 square mile (53 acres). Chin and Bamar (Yaw) nationals live together mixed. In Chin language, the meaning of ‘Zahaw’ is ‘Phetwarbin’. Their main occupation is agriculture, with livestock breeding to some extent. Agriculture mainly has to depend on rain water; irrigated farming gets water from private owned dams and village dams. Some villagers engaged in catching fish as the village is on the bank of the creek. Zahaw watermelon is quite famous selling home and abroad. The market is not a development market but it has big stores with variety of consumer goods just like shopping centre.

In 2008, seven houses were to be moved away to extend the State middle school; it was to rehabilitate these houses providing them with 75' × 75' plot of land for each family; so the villagers headed by village authorities had to take the responsibility for it. Moving process had to be done by the villagers providing transfer expenses themselves. The old village establishment pattern was three houses per street; but two houses per street for the newly extended ones. For the tidiness and security of the house when there is flood from the creek, house owners have to fetch gravel from the creek and put them in their home compounds. Village streets are also being enlarged. Zahaw, a model village, is in line with the 15 criteria of a model village.

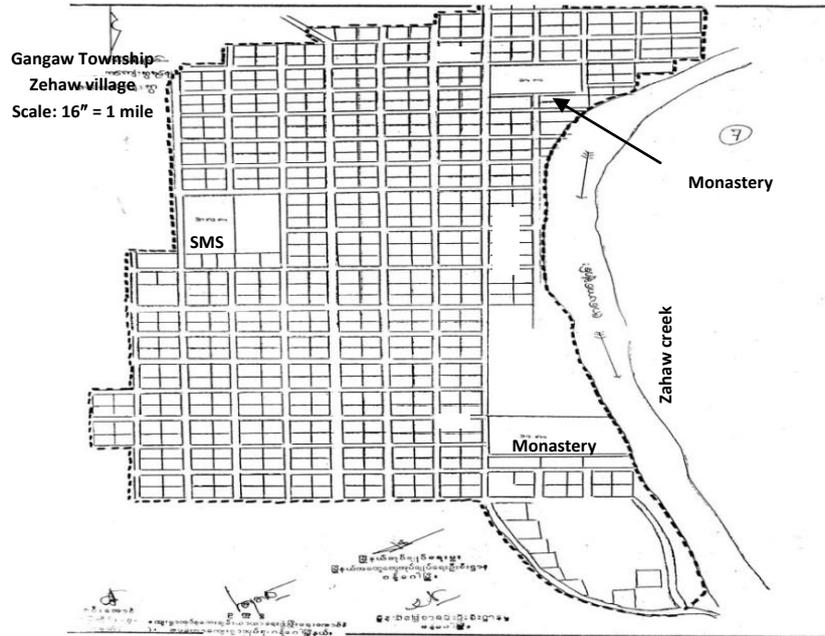


Figure- (3.5): Zahaw Village
Source: Land Records Department, Gangaw Township, 2012

Taung Kin Yan Village

Being situated on the bank of the creek, Taung Kin Yan village (see Figure-3.6) is 40 miles far from Gangaw. It now has the area of 0.13 square mile (85 acres). It is said that Taung Kin Yan is delivered from “Tekkathan”, (တက်ကသန်း) an “indaing hill”, meaning “village near the river”. In 1976, village renovation work (4 houses per compound, 90' × 90' plot of land per house) was conducted.

Main occupation is agriculture; livestock breeding to some extent. After the completion of the Taung Kin Yan dam in 2002–03, systematic irrigation to paddy fields has been carried out. Agriculture has changed from rain-fed to dam water-fed. There is no much land in Taung Kin Yan to make room for farms like Myauk Kin Yan.

Transportation from Gangaw to Taung Kin Yan is accessible by train. Car road is the earthen one and so travel by train is more usual. Based on the dam construction though, good transportation also causes the village developed more due to better production of crops. Taung Kin Yan village is also a model village in line with 15 criteria of a model village. No development market, but all the houses on roadside is quite busy with homeshops.

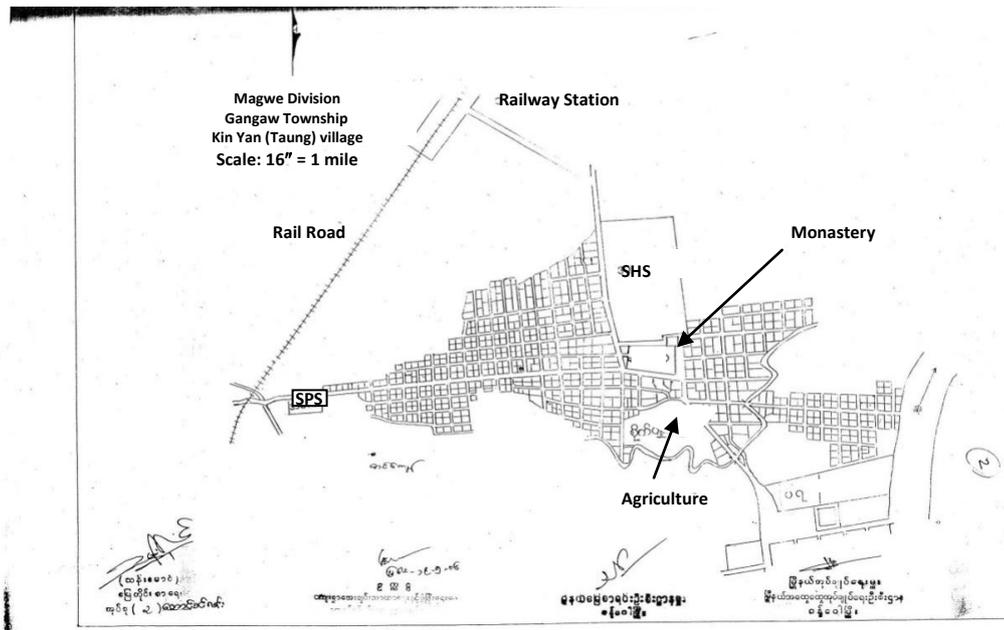


Figure - (3.6): Taung Kin Yan Village
Source: Land Records Department, Gangaw Township, 2012

Myauk Kin Yan Village

Myauk Kin Yan village (see Figure-3.7), 46 miles far away from Gangaw, stands six miles in the north of Taung Kin Yan village. It now has the area of 0.25 square mile (158 acres). Agriculture is the main occupation of the village with livestock breeding on self-help basis. The Taung Kin Yan creek stands near the village.

In previous days, village dam was constructed blocking the creek for agriculture. In 2002–03, the government built a dam and systematic irrigation system has been practised. Myauk Kin Yan village has a lot of reserve land area to make room for farms, thus leading the villagers to economic development.

Moreover, Myauk Kin Yan village has a good transportation linkage; railroad is accessible to Kalay. Being the earthen car road, the villagers mostly travel by train. As a result, vegetables and crops that come from Chin Hill via Kalay, and Indian made consumer goods that come via Tamu are often sold here in the village. No development market, but home shops are running everywhere.

In the village, State High School (branch), monastery, village administrative office, village library, NGOs, health, sanitation, and fly-proof latrine management, etc., have taken place. In addition, the rural health centre was inaugurated in Myauk Kin Yan village in 2008.

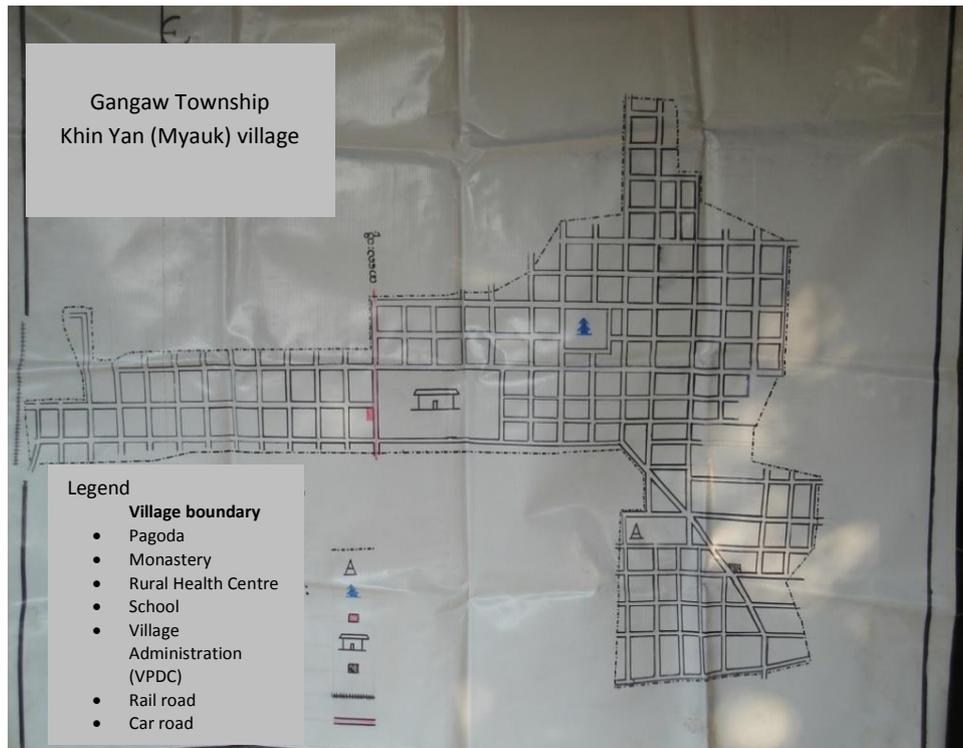


Figure- (3.7): Myauk Kin Yan Village
 Source: Land Records Department, in Gangaw Township, 2012

Kyaw Village

Kyaw village (see Figure-3.8) exists between Pontaung and Ponnya mountain ranges that are eight miles far away from each other. It now has the area of 0.14 square mile (87 acres). Agricultural and livestock breeding on self-help basis are the livelihoods of villagers. In previous days, butter bean, the product of Kyaw region, was one of the export items of Japanese market. At present, trading goods and forest products have become popular. For agriculture, effective growing has been blocked by the dependency of rain water.

One needs to pass through Pontaung and Ponnya mountain ranges to get to Gangaw. Kyaw village is (27) miles far away from Gangaw, being accessible to get there by train. It is also possible to go to Kalay by train conveniently, and trading Indian consumer goods and the products from Chin Hill has been booming. Being the junction of car roads (see Figure-3.9) and railroads, every house beside the road becomes homeshop, making the town quite busy with merchandising. As per a 78 year old kyaw villager, people in the village had seen the motorcars only when

Mandalay- Sagaing-Monywa-Hakhar road had been completed. Our grand parents had gone dead without having even seen motorcar.

Moreover, most of the local villagers have become prosperous by selling things to those who migrated into the region to work as labourers in oil extraction, construction of factories, railway construction, etc. Kyaw village has now developed being endowed with State high school, hospital, police station, village administrative office, village library, monastery, etc. beyond the criteria of 15 points identified to be a model village.

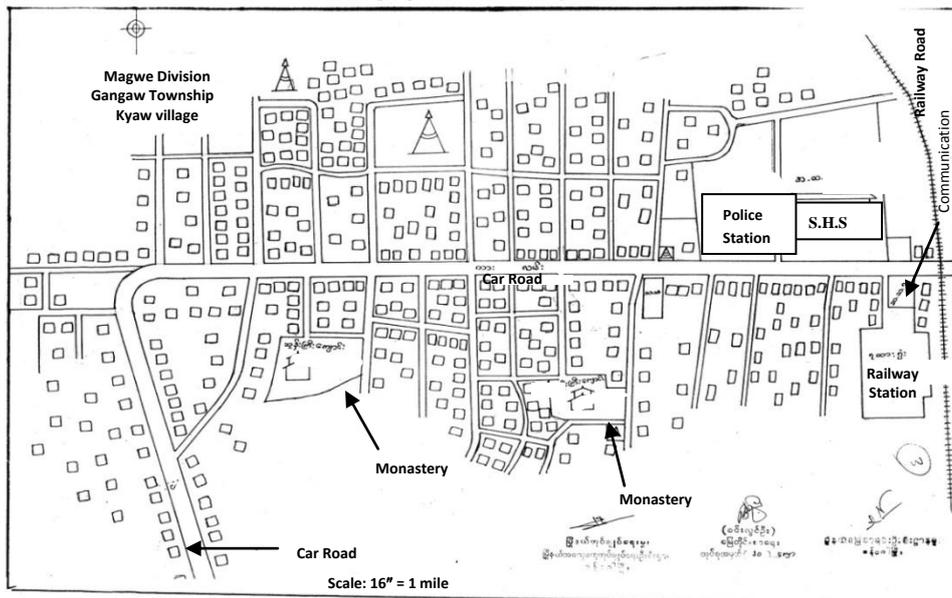


Figure- (3.8): Kyaw Village
Source: Land Records Department, in Gangaw Township, 2012



Figure- (3.9): The car road in Kyaw Village

3.5 Study period

The study took place from June 2008 to May 2012. The detailed time frame chart for this study is presented in Appendix II. In 2008, the pilot survey was first conducted for (8) days from July 23 to 30. In 2009, Field work was done for (17) days from 9.12.09 to 25.12.09: 3-5 days/ village in (5) study villages. In 2010-11, Field work was also done for (20) days from 28.12.2010 to 16.1.2011.

3.6 Data collection methods

In order to maximize the descriptive study of qualitative data, it is useful to enumerate a number of different qualitative methods. While they clearly do not exhaust the full range of field methods that might be drawn upon, particular emphasis on the use of ethnographic observations, in-depth interviews (IDIs), key informant interviews (KIIs), focus group discussions, focus group interviews, participant observation and data from document review were placed. The document review was conducted to collect the datas of villages' populations (see Appendix-III), economic, social and religious status in Gangaw Township (see Appendix- IV), and total of pass rate of the students by academic year Gangaw Township/ village (see Appendix-V). In this study, five different types of research methods were included to enable data triangulation. In the study that follows, each of these methods were briefly discussed, and the ways in which they might be employed in conjunction were examined.

Ethnographic observation

Ethnographic observation has traditionally been used in disciplines such as anthropology and sociology to collect data about a wide range or spectrum of social behaviour (Burgess, 1982). Immersing themselves in the flow of daily life within a community, researchers have attempted to observe significant aspects of social interaction and to extrapolate from such interaction the underlying rules or norms that govern behaviour within a community. Precisely because of this, the ethnographic method can be especially useful in offering insight into the cultural adaptation in this study area in different settings.

In this study of cultural adaptation, since the most intimate social life opened to direct observation, attention focused above all else on the context of social interactions. A strategy for ethnographic research was built up by beginning with an inventory of such spatial divisions, and then elaborating a systematic schedule for observation in these areas.

Although it is perhaps implicit in almost all discussion of the ethnographic method, it is perhaps worth noting that ethnographic observation entails not only visual observation in the strict sense, but also verbal interactions between the researcher and native people present in different settings. Informal interviews in the field provided a range of extremely be possible to develop these interviews systematically. Together with the information gathered through direct observation, however, data collected in ethnographic interviews offered perhaps the broadest record of cultural adaptation available in different settings. The field notes were facilitated the ongoing evaluation and re-evaluation of the central issues and topics that provided the focus for ethnographic observation.

Key Informant Interview (KII)

Key informant interviewing is an integral part of ethnographic research. Key informants who might be competent on this topic were selected. So, key informant interview (KII) were conducted with village elders, heads of the households, health personnel and the local commissioners of communal land. They were used to collect these knowledgeable informants' questions about life history in the communities. Key informant interviews were done till sufficient data is collected.

During pilot survey in 2008, (5) KIIs were conducted to study the life history of the local people, their environmental changes, cultural changes, cultural remnants, socio-cultural patterns of the local nationals. During 2009 survey, a total of 40 KIIs (8 informants per village × 5 villages = 40 informants) were conducted; during 2010–11 survey 50 KIIs with 50 informants.

In chapter IV, Environment and population, household was selected randomly to include woman between 20-49 years old who lives together with her husband at the time of survey and she has three or more children. Acceptance of birth spacing methods was also considered during the survey. It was meant basically to explore any changes in demographic behaviour. The assumption was after 1988 when socio-

economic situation changed. It was planned that field work was done to collect information on household census, types of families, and differences between bigger and smaller villages in every summer, rainy season and winter.

Some respondents could not complete an interview in one sitting due to their other commitments, and the second time interview was made to be completed. For example, such incidents as participation of the villagers in railway construction, continuous and excessive sales of consumer goods due to a flux of migrants, advantages and disadvantages inflicted upon the villagers were too numerous to complete studying right away. Moreover, the data transcripts gathered during 2009 field study by the note taker, and those of by the researchers were recorded on MP3 player, and data processing was carried out. After that the necessary points were kept on discussing when 2010–11 research was being conducted. For example, points regarding the Taung Kin Yan government dam, appointment of channel labourers, channel situation, duties and responsibilities of channel heads, activities on channels, land use patterns were discussed with key informants.

In education sector, school headmasters, senior teachers were selected as informants. Extensions of primary schools, middle schools and high schools, school enrolment rate, pass rate were discussed. Guidelines for key informant interviews were prepared, and utilized them in all five study villages.

In depth interviews (IDIs)

In depth interview is conducted to obtain detailed information on socio-cultural changes on Gangaw Township. Sometimes, in depth interviews were conducted with key informants such as heads of the households, housewives to study the economic condition, ways of acquiring wife and person's case study. The information on sterilization (birth spacing method) was explored through case study. Intensive case study method was applied to explore information from small groups of families.

While in depth interviewing is a key component of almost all qualitative research, independent of the specific research topic, it is perhaps especially important in the case of research on economic condition. Of the six study cases that become prosperous through trading, three cases were utilized and In depth interview with a total of (15) participants (three persons from each village) were conducted. This was sufficient to achieve data saturation of Matrix analysis and the unit of analysis.

Depth interviews were conducted in the respondent's home. The setting for the actual interview was private, quiet and comfortable and not intimidating. Interviews were tape-recorded after gaining consent from the participants. In depth interviews lasted approximately from an hour to an hour and a half.

Participant observation

Fieldwork can involve two quite different roles, that of participating observer and that of observing participant. By far, most anthropological research is based on the first role, that of participating observer (Bernard, H.Russell, 1995). Participant Observation is conducted to validate field data and involve intense social interaction with people in their own setting which can lead to fruitful cooperation. While staying in field area, daily activities and special events were participated. In this study, going up to the fields and participating in the groundnut harvesting activities: the observation was carried out to be as authentic as possible. Four kinds of groundnuts: Tontarni (တွန်တာနီ), Spate (စပိတ်), Stoke (စတုတ်) and Theipan (ဒိပုံ) are known by doing participant observation.

Justification for Focus Group Discussion and Focus Group Interview

The objective of the study is to observe the socio-economic life of the local communities in Gangaw Township during the period from 1962 to 2010 in line with its development and adaptability of the people to their environment. Therefore, when the data in the five study villages were collected, the socio-cultural changes were emphasized during four decades- 1970, 1980, 1990, 2000, 2010. These were divided into three age groups to do Focus Group Discussion (FGD). The combinations for the dimensions indicated were:

18-24 years of age: 2FGDs (1for male group and 1 for female group)

35-45 years of age: 2FGDs (1for male group and 1 for female group)

Over 55 years of age: 2FGDs (1for male group and 1 for female group). There were (7) participants in each group and altogether (6) FGDs.

For education sector, above 12 years old were selected to do Focus Group Interview (FGI) sessions for studying middle school and high school in study villages. One FGI was done per study village to cover five FGIs for targeted five villages. One FGI was

conducted with five students. All interviews were conducted in Myanmar (my mother tongue).

Focus Group Discussions (FGDs)

Focus group discussions were worked out in the third time observation period in 2010-11. The use of FGD for the collection of qualitative data has been developed most in market research, where it has been especially useful in offering quick answers to specific questions. Normally, a focus group meeting is a discussion in which a small group of informants (perhaps 6-12 people) guided by a facilitator or moderator, talk freely and spontaneously about a set of issues under investigation (Morgan, 1988). In this study, although FGD was utilized mainly for "Chapter 5: Economic resources and subsistence patterns", the data for the remaining chapters were also included in the FGD to confirm the exactness of the data.

It was decided to utilize the tools " Focus Group Discussion (FGD): 2 FGDs (1for male group and 1 for female group) 18-24 years of age; 2 FGDs (1for male group and 1 for female group) 35-45 years of age; 2 FGDs (1for male group and 1 for female group) over 55 years of age.

Kyaw village started to develop after 1988 and two FGD sessions (one each for each gender) were done to include these villages with the age between 18 and 24 (see Figures- 3.10, 11) to explore their view on culture changes after 1988. The study aimed to explore the view on changes in Taung Kin Yan village and Myauk Kin Yan village after the Taung Kin Yan Dam construction in 1993-94. That FGD covered villagers with age between 34-45 (one FGD with male participants and one FGD with female participants) (see Figures-3.12, 13). The researcher also were explore the comparative views among Chin National and Bamar National on the changes and development in the study area. In Zahaw and Shon Shi villages both Chin National and Bamar National (Yaw) reside together so that two sessions of FGD (one FGD with male participants and one FGD with female participants) were done in these two villages with the age of over 55 to collect the data on any comparative views on Culture change among Chin National and Bamar National (see Figures-3.14, 15). Each of the above FGD session included seven participants.

One person acted as a note taker in each FGD session. A note taker was trained for two days during the pilot survey period; the note- taker was trained again in the second year observation period so as to be ready for six FGDs.



Figure (3.10): Male, 18-24 group in Kyaw



Figure (3.11): Female, 18-24 group in Kyaw



Figure (3.12): Male, 35-45 group in Taung Kin Yan



Figure (3.13): Female, 35-45 group in Myauk Kin Yan



Figure (3.14) Male, over 55 group in Zahaw



Figure (3.15) Female, over 55 group in Shon Shi

Focus Group Interviews (FGIs)

For education sector, above 12 years old were selected to do FGI session. One FGI was done per each study village to cover 5 FGIs for targeted 5 villages. Those students who were reluctant to talk were excluded from the participation. Students were reluctant to respond to the questions related to school disciplines, rewards and punishments mechanism. One FGI was conducted with 5 students (see Figure-3.16). Attitudes towards their expectation and way forward beyond the high school were also explored. Each FGI took at least 30 minutes. FGIs were done in Kyaw, Zahaw and Taung Kin Yan villages during the 2nd field visit. And then, FGIs were done in Shon Shi and north Myauk Kin Yan villages during the third field visit.

Perception and beliefs of the students on classroom environment were explored through FGI. The questions covered on the topics were related to the life history of schools in that region, relationship between education and environment, chronology of the establishment of the school, structure of the learning environment, daily school schedule for students including environment awareness activities, physical exercise program. The interviews also included facts on genetics topics, disciplines and classroom management category, rewards and punishments systems, the types of examination. FGI, observation and KII were done to triangulate the finding.



Figure- (3.16): FGI conducted with 5 students

3.7 Variables

There are two variables: conceptual and observable variables. The two variables are associated with one another. When two variables are related they are said to covary: covariation is called correlation or simple association. It is usually better, for establishing cause and effect, if variables are strongly and consistently related, but this is not always the case (Bernard, H.Russel 1995). Regarding strength of relationship, consider the following example. Farmers in Gangaw Region make decisions about acceptance of new technologies (fertilizer, cropping systems, hybrid seeds, credit, and so on) but these decisions are made on the basis of many simultaneous factors, all of which are weakly, but causally related to the final decision.

Besides a nonspurious association between variables, one other thing is required in order to establish a cause-and-effect relationship between two variables (Bernard, H.Russel 1995). Advantages and disadvantages of socio-cultural system are relationship between the transportation and communication development and agricultural development because of irrigation after the construction of dam in Gangaw Region.

3.8 Data analysis

Before going into the field research, researcher analyzed available archival data, including photos, birth, death, marriage and tax records and landholding documents. These data helped place the communities to be studied in a broad context. During field work, the accumulated field notes, photos, tape recordings were carefully managed to reduce bias, distortion, and discuss the problems and missing links and collect missing information. The purpose of analysis is to obtain meaning from the collected data (Myanmar Academy of Arts and Science, 2002). After the data collection, these data were analyzed, making sure to cross-check the tentative findings Matrix analysis of major themes in data, including, censuses, observations, and archival materials (Bernard, H.Russell, 1995).

In this study, the typical mode of display has been extended, in reduced text; usually in the form of written up field notes, which the investigator scans through, attaching codes and then extracting coded segments and drawing conclusions. The researcher then wrote a second form of extended text: a case study (Miles.Matthew B, Huberman

A Micheal, 1994). FGDs were transcribed and organized on the basis of emerging themes and sub-themes. Researcher of the study read over the transcripts to identify themes before organizing data. Matrix analysis was performed according to main themes and sub-themes.

Moreover, one of the very first things to do in any research project is decided on the unit of analysis. In an ethnographic case study, there is exactly one unit of analysis- the community or village or tribe (Bernard, H.Russell, 2006). In this study, the units of analysis were villages rather than towns. Researcher focused on farms instead of farmers: or on market unions instead of market unionists.

3.9 Ethical considerations

First, Chairmen of the village administrative offices where the study was to be conducted were asked for permission to make research activities. Questionnaires were prepared in advance not to interfere the respondents. Respondents were to be informed about the research activities first and that they had a right to quit the research activities at any time, and that some questions they would not feel like answering might be left aside. For structure interviews, too, photo recording, video recording, voice recording were to be done only after getting the permission of the local communities. The findings and observations were then to be approved by the local authorities as well as the associations respected by the villagers.

3.10 Strengths and Limitation of the study

Strength of the study

After 1962, such local development activities as renovation and new construction of bridges, such physical infrastructure as building roads, construction of the dam and establishing the model villages, such human infrastructure as contribution of Rural Health Centre (RHC) and building high schools in education sector were being made a great deal in Gangaw region. It is, therefore, quite possible to collect data regarding the life style changes of the villagers characterized by the environment impact on culture and the culture impact on environment. Moreover, it is also possible to do so through visual observation.

The whole thesis, in fact, is compiled dividing into four decades — 1970-80, 1980-90, 1990-2000, and 2000-2010. And so data collection could conveniently and properly be conducted with pie diagrams and models in every chapter to identify annual changes in the study area.

Weakness of the study

It was intended to visit the study area in every season — summer, rainy season, and winter alike — but in practice, it was possible to do so only in rainy season and winter. As a result, it was impossible to see such activities as collaborative seed sowing for summer paddy cultivation, shared expenditure for paddy growing, and equal sharing of dam water, etc. The agricultural activities and ceremonies that are usually conducted and held in the summer were not able to study visually; moreover, in studying through cultural ecological approach, findings and observations done in other countries were only used as references since no other journals and reports depicting research activities in this field had not yet been published in Myanmar.

CHAPTER (4)

ENVIRONMENT AND POPULATION

Study villages in Gangaw Township was visited during 2008-2011 to get information and to become familiar with the situation. It was meant basically to explore any changes in demographic behavior. The assumption was that demographic changes took place in the area after 1988 when socio-economic situation changed. In this chapter, household was selected randomly to include woman between 20-49 years old who lives together with her husband at the time of survey and she has three or more children. Acceptance of birth spacing methods was also considered during the survey. Anthropological approach was applied to focus relevant points to design the study.

4.1 Natural environment

Gangaw Township, locating between the Pontaung and Ponnya mountain ranges, is a woody region. It has plentiful natural resources not only for fuel wood but also for medicinal plants, the reason why traditional medicines in Yaw region were well-known. To fulfill the requirement, there also exist wildlife animals for being hunted, so hunting and animal ranching are important careers in the region. Several plant species for animal feed and for other products are plentiful.

As Zahaw village is situated near the Zahaw creek, the source of water, flood is common for the villagers every three years. Due to the floods of the creek, one villager is annually dead. There are trees and forests near the village. They provide shade and firewood to the villagers. They not only prevent bank erosion but also provide the villages with fruit and timber.

Forest fire often breaks out (once a year) in the hills usually due to the hunters who come from the Chin hill through making fire to protect themselves from mosquito bite. It usually breaks out in March and April on both the Chin Hills as well as the Pontaung and Ponnya mountain ranges. It is, therefore, needed to carry out fire prevention measures, and thus, in Taung Kin Yan village, every household is to participate in the campaign under the leadership of the “head of ten household”: clearing the bushes around the village so as not to catch forest fire, arrangement of fire hooks, fire flaps, and storage of sand and water.

The ashes caused by the forest fire are carried into the rivers and creeks and transformed into alluvial soil. The nutrients in the soil are again sent to the leaves and branches of the trees through the roots. When the trees are cut down, the tree trunks, leaves, branches and roots become rotten and formed into valuable nutrients again. Thus, the sandbanks are rich with valuable nutrients again. Thus, the sandbanks are rich with valuable nutrients for crops, plants and vegetables which are again consumed by people and animals and thus they live healthy and strong throughout their lives.

The disadvantages of forest fire are forest degradation. The main problem in the Gangaw area regarding the environmental conservation is overexploitation of forests. Most of the forest areas have been damaged through cutting wood (see Figure-4.1). No forests are seen near the town at present. Local people in Gangaw region were not skilful in forest managements. They could not handle the forests properly. But now they are trying to be in line with the current requirement of the natural forests. Guidelines to grow trees (3 teak trees, Kyun- *Tectona grandis L.f*) per household (see Figure-4.2), and to utilize fuel wood as per the principles set forth are now have been arranged.



Figure- (4.1): Extration of wood



Figure- (4.2): Teak trees grown by households

4.2 The management to adapt in the natural environment

Gangaw Township is situated in Pakokku District, Magwe Region, 142 miles far away from Pakokku, with a total square mile of 951.286; between 21°26' and 22°45' North Latitude, and 94° and 94°30' East Longitude; Kalay Township in the Sagaing Region is in the north; Mingin, Kani and Pale townships in the Sagaing Region, and Myaing Township in the Magwe Region are in east; Htilin Township is in the south; and the Hakha and Matupi Townships in the Chin State are in the west. Gangaw Township is at an elevation of 703 feet with the ranges of Ponnya mountain (3250') and the Pontaung mountain (3456') in the east. The area is a plain valley with mountain ranges lying from north to south and the Myitthar River flowing from south to north.

The Myitthar River that flows across the township originates from Matupi Township of the Chin Hill. It merges with the Mawcreek and Sathni creek and again with the Manipur River, that flows from Assam, near Sitthaung village, Kalay Township, and flows into the Chindwin River. Of the creeks that merged into the Myitthar River, Maw creek, Zahaw creek, Kwamze creek, Taung Kin Yan creek, Laungwut creek, Pene creek, Yaw creek, Hnankhar creek and Yanngai creek are noteworthy.

Due to the deposit carried along by the creeks and along the Myitthar River, the area is fertile and crop yield is very good. Crops like paddy, butter bean, and sesame are sown a great deal in the area. Pakokku District is noted as the area where production of the crops is the best.

In the rainy season, the monsoon wind carries vapour thorough the Rakhine Yoma, It changes into north wind, and meeting with the mountain ranges of Chin Hill, it rains all over in the area of Gangaw Township. There is always the north wind in the area of Pontaung-Ponnya and Chin Hills, creating a slogan: “No rain by south wind, but rain by north wind”. Due to the cold winds that blow through plateau in Myanmar, it is always cooler in these regions than the plain areas. An additional reason for this is the existence of the area among mountain ranges. As a result, the area is wet and warm in summer and cool and dry in winter.

Table 2: The maximum and minimum temperature of the Gangaw Township during 1970- 2010

Year	1970	1980	1990	2000	2010
Maximum Temperature	34.8°C	43.4°C	41.60°C	39.4°C	45.0°C
Minimum Temperature	10.0°C	7.0°C	4.9°C	10.0°C	7.7°C

Source: Meteorology and Hydrology Department, Gangaw Township, 2010

In 1970, the maximum temperature was 34.8°C and the minimum temperature was 10.0°C. Later, the weather became warmer, and the maximum temperature reached up to 45.0°C in 2010 and the minimum temperature 7.7°C, showing a great difference in temperature. It is assumed that due to the over-exploitation of forest resources, forests are degraded and thus causing rise in temperature (see Table-2).

Table-3: The average rainfall in inch and raining days in Gangaw Township during 1970-2010

Year	1970	1980	1990	2000	2010
Rainfall (inch)	60.31	47.04	56.63	48.39	42.94
Raining Days	100	84	90	83	88

Source: Meteorology and Hydrology Department, Gangaw Township, 2010

The average rainfall in 1970 was 60.31 inches and the raining days were 100. In 2010, the average rainfall was 42.94 inches and the raining days were 88(see Table-3). It was noted that the precipitation became reduced with less raining days. High temperature and less precipitation have been quite common. The urgent needs not to over exploit the trees, forester and forest resources, and to actively take part in the

reforestation and greening activities are obviously essential things to be urgently fulfilled by the local communities.

Forests, natural vegetation and resources

In Gangaw District, the tropical rain forests are quite common with such hard timber species as teak (Kyun- *Tectona grandis* L.f), padauk (*Pterocarpus Macrocarpus* Kurz), pyinkado (*Xylia xylocarpa*), thit-ya (*Shorea obtusa* wall) and ingyin (*Shorea siamensis* (kurz) Miz), etc, and such other species as binga (*Mitragyna rotundifolia* Roxb), hnaw (*Adina cordifolia* Hook.f), thinwun (*Millettia pendula*), letpan (*Bombax ceiba* L.), sha (*Acacia catechu* Willd), taukkyon (*Terminalia Crenulata*), yon (*Anogeissus acuminata* wall), different kinds of bamboo and cane, herbal plants, etc. Shady trees and perennial tree species were grown along the road sides, around the lakes and dams and on bare hill tops for the local greening through rainy season greening mass campaigns.

Table-4: The tree species grown and the amount of trees survived in Gangaw Township during 1998-2003

Tree species grown	Survival number	Percentage
palm	10519	12.35%
Tamarind	294592	34.34%
Plum	5000	0.58%
Neem	80832	9.42%
Thit-seint (<i>Terminalia bellerica</i> Roxb.)	161187	18.79%
Pepper	13080	1.52%
Total	660594	77.0%

Source: Gangaw District Gazette, 2003

Tree growing started in 1998 in Gangaw District: a total number of trees grown in 2002-2003 were (857910) with the survival number of trees (660594) and the survival rate 77.0%. The species grown were toddy palm, tamarind, plum, neem, thit-seint and pepper (see Table-4).

Table-5: Forest area in Gangaw Township in 2007

Type of land	Acre	Percentage
Forest Reserve	303615	57.06%
Virgin land	90979	17.10%
Fallow land	137478	25.84%
Total forest area	532072	100%

Source: Gangaw District Gazette, 2007

In 2007, the forest reserve area was (303619) acres: 57.06% of the total forest area (see Table 5). In former days, the government alone extracted teak and hard wood species, but now private companies are allowed to extract hard wood species. As a result, timber related business activities are quite common in Gangaw Township. On the other hand, reforestation and forest conservation activities are being carried out in the area. The forest plantation area in the township is 8560 acres; public owned forest plantation area is 90 acres. Greening activities were later carried out through erecting posters depicting to grow 3 teak trees per household.

In the area of Pontaung-Ponnya, as coal reserves have been found, shallow surface oil wells are being dug in some villages of the area. In the east of Kaungtin village of Gangaw Township, oil is extracted to some extent. Most of the oil wells in the village are generally hand-dug oil wells, availing 1-2 to 5 gallons of oil per group. In 2007, a joint venture (Myanmar-Chinese) oil test well was initiated 7 miles far away from Kyaw village. Test wells are supposed to be addressed near Sagar (စကား) village (6 miles far away north of the village) and near Yahgyi (ရာဇ်) village and Lapoe (လ ဝံ့) village (12 miles far away from the villages).

4.2.1 Construction of dams

Water availability in Gangaw Township is top priority as the area is surrounded by hills and mountain ranges. Dams are to be constructed for water storage in order to get water for farming. In Gangaw township, a total of 46 dams (1 government dam [the Taung Kin Yan Dam], 2 community dams, 9 development dams, and 34 private self-help dams) are now distributing water to 10547 acres of farmland area.

Construction of hand-made dams

In 1962, the “Pontoke” creek dam (see Figure-4.3) was built along with the setting up of Pontoke village under rural development project in Shon Shi village. The dam was able to distribute water to (30) acres of farm land. At present, (90) acres of farmland get water for farming from the dam. Moreover, water for cattle is now available and plenty of fish are caught in the dam.

In Zahaw village, small dams were built in 2008-09, collecting the water of mountain torrents, in 2009; there were four village dams and seven private owned dams. The embankments were made to construct dams and on these embankments, paddy is sown, resulting in the increase in farmland area and paddy production as well. The cost of building a dam ranges from 40,000kyat to 80,000kyat. Under the arrangement of local authorities, the villagers can hire excavators free of charge, requiring only spending 4 gallons of oil per hour. Of the village dams, the Myauklaybin dam and the Kapwe dam can distribute water up to 15-20 acres of farmland; the remaining dams up to 10 acres.

In olden days, crops were unproductive due to scarcity of water. Now crops are productive due to the availability of dam water, and double cropping is also possible for farmland areas close to dam. Some drawbacks resulting from construction of dams are floods in rainy season for farmland areas close to dams, and scarcity of water for farmland areas far away from the dams in drought years. Nevertheless, it is only 10% for drawback whereas there are 90% advantages.

As per a 72 year old Zahaw villager, the Tinthan dam (see Figure-4.4) was built in 2008. I had to offer meals to the machine operators for three days as the worksite is on my farm. In rainy season, due to flood of rain water, my farmland close to the dam was overflowed as there was no water outlet (see Figure-4.5). In previous years, the yield of paddy was 80-100 baskets (1basket = 46 pound) per acre. After the construction of dam, the yield per acre has been about 40 baskets (1basket = 46 pound) per acre. For me, this dam is of no use. I got more paddies in previous years before the construction of this dam.

In Taung Kin Yan village, hand-made dams were built 100 years ago, blocking the Taung Kin Yan creek to make dam. Taung Kin Yan villagers reclaimed the virgin soil (750 yd × 750 yd) to make room for farms as per the approval of the authorities

concerned sharing the farmland among them. They made hand-made dams to irrigate the farmland because of no water in Myitthar River and Taung Kin Yan creek in summer.

In 1970, a development dam was built blocking the Taung Kin Yan creek with (22) members initially, but after reclaiming the virgin land and more farmland being made, it was required to get more water and the member of farmers increased up to 57. In building this dam, the farmers themselves contributed labor without hiring any laborers. First and foremost, the Taung Kin Yan creek was filled with branches of trees, putting stones on them and inserting earth after all. The dam can irrigate 800 acres of farmland for Taung Kin Yan village and 700 acres of farmland for Shwebo village, totaling 1500 acres of irrigated farmland up to 1992.

In Kyaw village, too, a hand-made dam was built in 1970; in 1990, there were three hand-made dams. In 2000 and afterwards, there have been (4) handmade dams, namely the Muayuktaw, the Phankharbin, the Kyobin and the Khaunglaungkha dams. The reason why Kyaw village has fewer dams is that there exists no virgin land around the village to make room for more farms. Availability of water makes good results in farming. Good production of crops will again support people with plenty of food and this in turn will encourage people to carry out their respective work including agriculture. Therefore people have to endeavour to create situations that will upgrade their socio-economic life.



Figure (4.3): The Pontoke creek dam in Shon Shi Village



Figure (4.4): The Tinthan dam in Zahaw Village



Figure (4.5): The overflowed farmland close to the dam

Taung Kin Yan Dam

The construction of the Taung Kin Yan dam (see Figure-4.6), six miles far away from Taung Kin Yan village in the south-east, started in 1990-91 and completed in 1993-94, irrigating water to Taung Kin Yan, Myauk Kin Yan, Shwebo, Tharlin and Thintaw villages and North Western Command farmland areas. In 1994, a total of 1000 acres of land was irrigated; and in 2007, 4157 acres. The expected irrigated area is 5006 acres. In 2010, the Taung Kin Yan dam was able to irrigate a total of 5790 acres, 700 acres more than expected. Although Myauk Kin Yan village practises one crop per year system, Taung Kin Yan village practises double crop system, thus changing the farm areas of the two villages into irrigated farmland areas. Therefore,

the slogans such “Double crop in paddy field”, “Multiple crop in farm land area” are commonly seen in Taung Kin Yan village streets. After the completion of the dam, some farmland have been transformed into paddy land.

The watershed area of the Taung Kin Yan creek is 33 square miles. The type of dam is earth dam: (610) feet in length, (90) feet in height; top of dam, 20 feet in length; height of dam, RL-(705) feet; highest depth of water, RL-(694-79) feet; volume of water storage, (11729) acres feet; lowest depth of water, RL-(653-38)-feet; volume of water storage (lowest), (1628) acres feet; full water surface area, (365) acres; volume of water that can be used, (10100) acres feet; the height of drainage, RL-(694) feet; the width of drainage terrace , 160 feet; the height of water outlet , RL-(653) feet; number and size of sluice gate water outlet (see Figure-4.7), (1) and (4' × 4'); length of canal, 25 miles; irrigated area, (5006) acres; confirmed irrigated area, (5790) acres; cost of work , 28.7 million kyat.



Figure (4.6): Taung Kin Yan dam



Figure (4.7): Sluice gate water outlet

4.2.2 Canal staff

Of the five villages in the study area, canal staff was appointed previously in Shon Shi and Taung Kin Yan villages. For the remaining three villages, no canal staff was appointed, it is observed, because the dams in those villages could irrigate only 10-15 acres of farmland.

The duty of a canal staff is to inspect the loopholes and erosion of the embankment, safeguarding the drains in good condition, and managing water supply (see Figure-4.8). In Shon Shi village, one canal staff is appointed, earning one basket of paddy (46

pound) per house from rich farmers and half a basket (23 pound) of paddy from poor farmers, a total of 40 baskets (1840 pound) of paddy per year.

In Taung Kin Yan village, there was a canal staff as its dam could irrigate 1500 acres of farmland. After the completion of the Taung Kin Yan dam, two staffs who were in charge of the canal, two daily wagers (2200 kyat /month each). In Taung Kin Yan village only one person is appointed as the canal staff or the canal in charge. There are 19 canal workers under his control in the rainy season. Each canal worker earns about 50 baskets of paddy per year. Each farmer shares one basket of paddy per year for canal workers. Building dams in this way, not only production of crops increases but also job opportunities are created for local people.



Figure- (4.8): Canal staff managing water supply

4.3 Water

In Gangaw Township, a great number of streams exist and so it is impossible to dig lakes. The reason is because the streams are generally torrential and are used to float timber as well. In olden days, Gangaw region had to depend on rain water for farming, and sometimes had even to practise dry farming. For drinking water, there only 2-3 wells exist in a village and each and every household has to carry drinking water from those wells. For sanitation and bathing, water villagers still have to go to the creeks nearby. Previously the creeks near the village were full of water when it rained in rainy season, but when there was the scarcity of rain, some creeks totally dried up in summer. In that, both the villagers and cattle alike had to face with the

problem of water scarcity. The scarcity of water again resulted in the adverse economic and health effects.

Drinking water is still being carried from wells. In Shon Shi village there were 10 handmade dams in 1970, 15 in 1990, and 17 in 2010. Now there is one tube well. In Zahaw village, there were only 2 hand dug wells in 1970 (in the monastery compounds donated by the public where village girls come and carry water), 15 in 1990, and 25 in 2010 (see Figure- 4.9). Now there is one tube well. In Taung Kin Yan village, there have been more wells dug and used, as the wells retain water at the depth of 15-20 taungs (1 taung = 18 inches) after the completion of the Taung Kin Yan dam. Hand pumps are now used to get water from wells. There were 23 hand-dug wells in 1970, 133 in 2000, and 230 in 2010 (see Figure-4.9). There are only one tube well in 2000 and 5 in 2010.

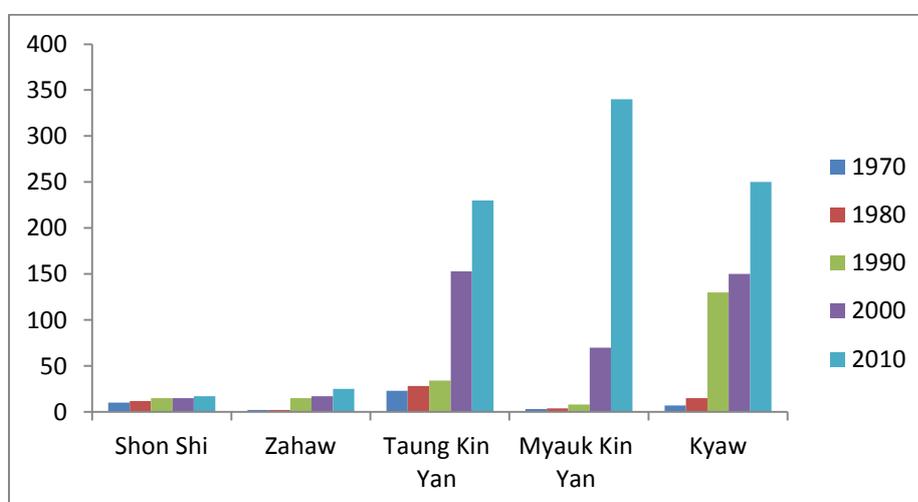


Figure- 4.9: The status of using wells of the five villages in the study area

Source: Field survey in 2010-11

In Myauk Kin Yan village, there were only 3 hand-dug wells in 1970, 70 in 2000 after the completion of the Taung Kin Yan dam, and 340 in 2010 (see Figure-4.9). Water pumps have been used since 2008 and now there are altogether 15 water pumps in the village.

In Kyaw village, there were 7 hand-dug wells in 1970, 150 in 2000, and 250 in 2010 (see Figure 4.9). In Kyaw region, a deep tube well was drilled in 2010. In 1991-92, a project for the availability of water in the hospital compound of Kyaw village initiated under the assistance of UNICEF. The streams near the village were tested in view of being able to distribute 25-30 gallons of water per head in accordance with the

number of villagers and cattle currently existed in the village. Thus villagers contributed labor in site-cleaning and digging earth work.

A 56-year-old local national said. “In 1993-94, there was a water project by UNICEF. The personnel from UNICEF asked the village head when the appropriate time to start the project would be. He replied whatever time they could start. The team unexpectedly arrived in at the start of the cultivation season, and all the villagers had gone out to contribute labor in the rail road construction work, leaving only one person per household in the village to look after the house and the cattle, and to engage in farm work. To contribute labor for water project was the sole responsibility of the remaining one in the household. At this, some villagers even wept, and there were some who fled the village. The pipes with the length of 18-20 feet were delivered, and the villagers had to dig ditches to put these pipes, shoveling soil over them and returning to do their farm work again – a real hard time for villagers. The result of it was the decrease in production of crops, scarcity of food and water, infection of malaria. But on the other hand, the advantages such as local community development and sufficiency of drinking water have been accomplished”.

In Kyaw village, in 2001-2002, in place of the common dug-wells, the tube wells were addressed with the strengths of time-saving, taking less space and expenditure. The expenditure for a dug-well is (5) lakhs whereas only 50,000 kyat for a tube well, demanding only 3-5 labourers — half the man power of digging an ordinary dug-well (see Figure-4.10). The depth of a tube (see Figure-4.11) well is only 15' - 22 ½' just like an oil well, giving continuous water however much water is pumped. A tube well will serve enough water for a family. Nevertheless, drinking water needs to be fetched from drinking wells and ponds called “Flankan” (ဖလန်ကန်).



Figure- (4.10): The common dug-well Figure- (4.11): A tube well like an oil well

4.4 Cultural ecological approach to background history of Gangaw Township The formation of Gangaw Township

In the history of Myanmar, it is learnt that the prince Karapaw, the eldest son of the Great King Thuna in Mijima (India), being ordered to go to Myanmar to establish a new country by his father, came here to Myanmar and founded the town of Halin. King Karapaw reigned the west region of Ayeyarwaddy and named his country after Thunarpranta.

Then again the historian researchers have said that King Kawliya Abiyarzar fought against the King of Thinkathanago. Being defeated, Abiyarzar fled to Myanmar and founded Tagaung. When Abiyarzar passed away, the two sons, Kanyarzargyi and Kanyarzarngai, quarrelled, and Kanyarzarngai came to the throne. Kanyarzargyi, thus, settled at Kalay Taungnyo region. The country initiated by King Karapaw was thus succeeded by Kanyarzargyi and his successors; it was stated in the Gazette of Gangaw District (2003).

In the year 73 of Sasana Era (471BC), a King from Magada Country came to that region and founded a country. His name was Zalamika who was compelled to go away from Yarzagy by its citizens. He founded Ariminya, now called Yarzagy, east of Nankayin creek, with a total of 5000 households. Then he enlarged his country, defeating Shan, Kadueingel, Patein, Pabe, Padaung, Pantale state countries. He named his new country as Yawnaka. The former region of Yawnaka now gets its name as Yaw. Yaw region thus comprises of Chindwin (Thanlarwady) and Ayeyarwady to the west, north east of Yakhine Yoma and east of Chin mountain range, to the south from Thaungdut to Pharaing Saytoketara Taungsin 7 districts. The four townships - Yawkyakhat, Saw, Laungshay and Htilin and its environs were recognized as Yaw region in the reign of Myanmar Kings. (Gangaw had not existed yet). Yawkyakhat is in another name of Yaw.

According to some scholars, King Narathihapatae of Bagan ordered Twinthinmu Thayaypisapatae to subdue the rebels in Myitzargiri region in Myanmar Era 604 (1243), on Thursday, the 6th of the waxing moon of Pyartho. Thayaypisayapatae and his soldiers got to the western part of Minbu and camped there. While camping, the army was destroyed for some reasons. When the king got the message, he felt so angry that he ordered Oakhla, son of Razathingyan, to kill Thayaypisayapatae on the

spot. Oakhla set off to obey the order but on his way he met Razathingyan who told him not to kill Thayaypisayapatae until he received a messenger from him. Razathingyan persuaded the king not to kill Thayaypisayapatae and thus he escaped from death penalty. The king also ordered to send the senior militia personnel and all the soldiers of different levels of ranks to four jungle regions (Thittawlayyat) in place of the order to burn them down. They thus got to the four jungle regions when the present west Gangaw is located in Myanmar Era 605 (1244). They searched for the proper place to found a village and discovered a good one. In the middle of the place they found a big gangaw tree and named the village Gangaw village in Myanmar Era 608 (1248). The villages – Kalataw, Chitaw, and Pauktaw – that were built simultaneously with Gangaw village have now disappeared. When U Aung Zay (Rantathura Kyaw Gaung), head of Minywa village, took an oath that the place on which Gangaw village had been founded belonged to him, U Kyaw Tun Phyu, the honest head of the village and his villagers shifted to the east bank of Myitthar river and founded a village there. From then on there emerged east Gangaw and West Gangaw.

Due to these evidences, it is quite obvious that Gangaw region has been called as Yaw region since the time of Bagan dynasty. Moreover, it is found that Yawnaka Division has been a region for Bamar nationals and other national settlers.

In the reign of Konbaung Dynasty, the original name ‘Kankaw’ has changed to ‘Gangaw’. In the reign of King Mindon, the word ‘Gangaw’ was found on the seals used for sealing logs.

Beginning from the reigns of Myanmar Kings, Gangaw has become populated. The journey to Royal City – from Gangaw through East Mountain Camp, Sarlingyi Sagar Circle, and Myimmu Ywarthitgyi – took ten days. Under the yoke of British colonialism, Htilin Township was administered with its office at Gangaw. Gangaw township Inspector office was inaugurated in 1887; the township inspector was U Kyar Sint. Such departments as forest department, hospital, post-office, telegraphic office took place Gangaw Township at that time. In the year 1930, the township Inspector of Pakokku added 19 villages including Gangaw Township into Htilin Township.

Under the British rule, Gangaw District was included in the Pakokku District; Gangaw was recognized as sub-division with the division inspector’s office at Gangaw with Htilin under its administration. In Gangaw and Htilin Township the

Inspector's office was set up: in villages, village heads were appointed. It was therefore observed that of the towns in Yaw region, Gangaw had been a town where government offices had been set up in the time of the British rule.

Gangaw Region after independence

The multicoloured insurgency, after the 1948 independence, broke out in Myanmar affecting badly in Gangaw, Htilin, Saw townships. Communist (Red flag) and Communist Party (White flag) were strongly rooted in these areas. In 1949, the month of October, Communist Party (Red flag) annexed Htilin and occupied it for a month. During the occupation, seven houses, police quarter, bungalow and township inspector's office were set on fire. Gangaw, Htilin and Saw townships were recognized as black and brown areas. The period from 1954-55 was the most powerful year for Communist Party (Red flag).

In 1956, the government initiated "Aungmarga" operation to dispose the insurgents in Yaw region. In 1958, the Communist Party (White flag) surrendered leaving Yaw region affected with the insurgency of the Communist Party (Red flag) alone.

The Red flag particularly based on the vicinity of Kyaw village, Gangaw Township, bullied and committed atrocious crimes upon the villagers of the region. Because of the Red Flag, regional development had much been delayed. Moreover, communication in the area was extremely difficult due to barrier of Ponaung Pownya mountain ranges. Having suffered from the atrocious administration of the colonialism and the impact of multicoloured insurgency, most government offices and thousands of homes of the local people in this region were destroyed, leaving the local community without access to economic recovery and community development alike.

Development activities in Gangaw Region

On March 2, 1962, the Revolutionary Council took over the state power and managed the security and administrative measures of the state. Different levels of administrative bodies took the responsibility of rural development activities. Rural development activities in the Gangaw Township were being carried out starting from the fiscal year 1962-63 by the township administrative committee. In 1967, Kanthar Dam of the Kanthar village was completed. In 1968, project activities to initiate Taungwun Dam project started. In 1972, the 23rd of July, Gangaw was promoted to

town level by the Ministry of Home and Religious Affairs of the Revolutionary Council. As per the notification of the ministry, there had been four wards, comprising 71 village tracts and 31 villages, totaling altogether 112 villages in the whole township. In 1973, Gangaw Township has become a 'white area' due to the participation and coordination between Tatmadaw and people in fighting against the insurgents.

Starting from 1965-66, Gangaw-Aikar road was initiated by military engineering corps and handed over to Construction Corporation in September 1973. In 1973, No.901 military engineering corps transferred the Mandalay-Sagaing-Monywa-Gangaw-Hakah road to the Construction Corporation. There were altogether 30.87 miles of tarred road and 14.12 miles of metalled road in Gangaw Township since then. The road sections needed to be tarred are annually carried out by the Construction Corporation.

In 1974, People's Parliament and different levels of People's Council emerged. Since it has become a 'white area', local communities of Gangaw were able to actively carry out economic, social, political and administrative development activities of their region on their own. Township People's Council Executive Committee, Inspection Committee, and Ward and Village People's Councils, Panal of Judges at all levels took the responsibilities of administrative activities.

During 1976-77, the maintenance work of Pakokku-Pauk-Htilin-Gangaw road was conducted: 0/0 was marked at the junction near Aungmyin village, Gangaw Township, and ended at the milestone No.78/0 on the main road of Hakah-Matupi in Chin State.

In 1978, the first of January, Gangaw electrical power corporation deployed 25 KW Dakota generator; in December 1980, 100 KW Dakota generator. Up to end of metalled road in Gangaw Township 1981-82, 4.25 miles remained to be paved, but at present it is totally completed. In 1979-80, a bridge across Kan-Yangai-Aung (Natchaung) road was built. In 1980-81, earthen embankment work for motorcar track was carried out. In 1981-82, the very road was renovated with the participation of the local people.

In 1981, the 31st of December, the local people from 20 wards and village tracts contributed labour to clear the wood and cut down the trees for the feeder road of Gangaw-Saingdo-Hakah. In 1993-94, the Taung Kin Yan dam of Taung Kin Yan village was completed and a total of 5000 acres of land were irrigated for double crop

and multiple crop system. In 1989, in the time of State Peace and Development Council, Gangaw Township was put into Pakokku District. As per the notification dated on 4 April, 1996 of the Ministry of Home Affairs, Gangaw, Htilin and Saw townships were combined into Gangaw District.

The general administrative department of Gangaw District was inaugurated on 8th April 1996. Chairman of Pakokku District Peace and Development Council. Col Tin Soe also took charge of the Gangaw District General Administrative Department. Different levels of Peace and Development Councils in Gangaw District have been taking the responsibilities since then.

Convinced of the sufferings of the local people and undeveloped status of the area due to communication constraints, the personnel of the State managed to implement the Pontaung-Ponnya railway tunnel (see Figure-4.12,13) project with a view to enhance the development of the whole area. The project started on 16th October 1996 and completed on 25th July 2006. At present, 106 mile journey by train (see Figure-4.14) can be made from Kalay-Gangaw-to Yaymyetni.

Such activities as clearing village land, forming plots of village land, paving roads, movement and construction of houses, monasteries and schools, construction of brick tanks, and other necessary activities were being carried out. For road and bridge construction activities, People Construction Enterprise takes the responsibility of construction and maintenance work. City Development Committees don't need to undertake the maintenance of bridges; instead, they have to undertake the maintenance of roads. The bridges are often damaged due to the obstacles of natural environment and its topography, of the intrusion of waterfalls and streams, and of the passing through by the heavily loaded trucks and passenger cars.



Figure- (4.12): The Ponnya-taung Railway Tunnel



Figure- (4.13): The Ponnya-taung Railway Tunnel



Figure- (4.14): The railway line in Gangaw Township

4.5 Social environment

4.5.1 The social and demographic conditions of stable high fertility

The age structure of the population was studied by two categories, the group with under 18 years old and the group with 18 years and above. The population of study villages in Gangaw Township was viewed for 5 periods of decades, 70's, 80's, 90's, 2000's and 2010's. In 1970 there was a population of 10,456 in the study areas which include 5 villages. There was change in population due to emigration. Two villages where both Chin and Bamar live together were also studied. In Shon Shi village Chin constitutes $\frac{3}{4}$ of its population and in Zahaw village Chin constitutes $\frac{1}{4}$ respectively.

In all 5 villages majority were Buddhists and with small proportion of Christian about 10% among Chin.

There were no complete records of birth and death registration before 1994. The first record was identified for 1994. The birth and death registration had been made available to people since 2006. In Shon Shi village the proportion of female in both age groups (below 18 and 18 year and above) higher than that of male. Table (6) and Figure (4.15) show the status of population changes from 1970 to 2010 in Shon Shi village. Much change was noted after 2000.

Table 6: Population distribution by broad age groups in Shon Shi Village, 1970-2010

census/ survey	Broad Age Group								Total Number
	< 18				18 +				
	Male		Female		Male		Female		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
1970	1028	28.16	1090	29.86	662	18.13	870	23.84	3650
1980	1060	26.17	1200	29.63	805	19.88	985	24.32	4050
1990	1070	25.54	1330	31.74	790	18.85	1000	23.87	4190
2000	1122	25.9	1348	31.15	812	18.77	1045	24.15	4327
2010	1180	26.43	1380	30.89	840	18.80	1067	23.89	4467

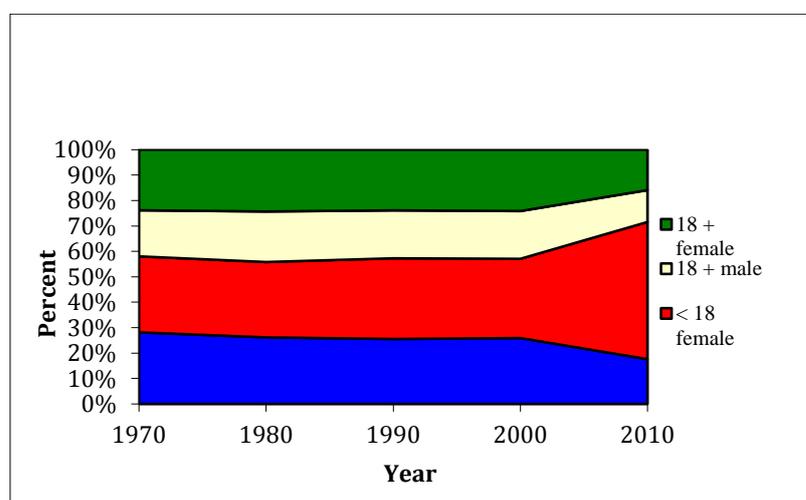


Figure-4.15: Population distribution by broad age groups in Shon Shi Village, 1970-2010

Source: Village Peace and Development Council, Shon Shi Village, 2011

In Zahaw village there was no major change in population during 1970 and 2010. It was noted that the proportion of female in Zahaw was higher than that of male. In 1970 male under 18 years was 24.3% and female in that group was 27.1%, male above that age group was 23.18% and female was 25.4%. The percentage decreased about half in both male and female group in 1980 (10.71% of male and 17.85% female). It was assumed that the reduction in the proportion of population under 18 year's old group was due to high mortality of child as a result of traditional way of delivery during 1980. In 2010 the percentage increased again (25.8% for male under 18, 28% for female under 18 and 20.4% for male above 18 and 25.04% for female over 18 respectively) (see Table-7 and see Figure-4.16).

Table 7 Population distribution by broad age groups in Zahaw Village, 1970-2010

census/ survey	Broad Age Group								Total Number
	< 18				18 +				
	Male		Female		Male		Female		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
1970	260	24.3	290	27.1	248	23.2	272	25.4	1070
1980	150	10.71	250	17.86	400	28.57	600	42.86	1400
1990	550	25.88	625	29.4	450	21.2	500	23.5	2125
2000	600	24.5	750	30.6	500	20.4	600	24.5	2450
2010	720	25.8	805	28.8	570	20.4	700	25.04	2790

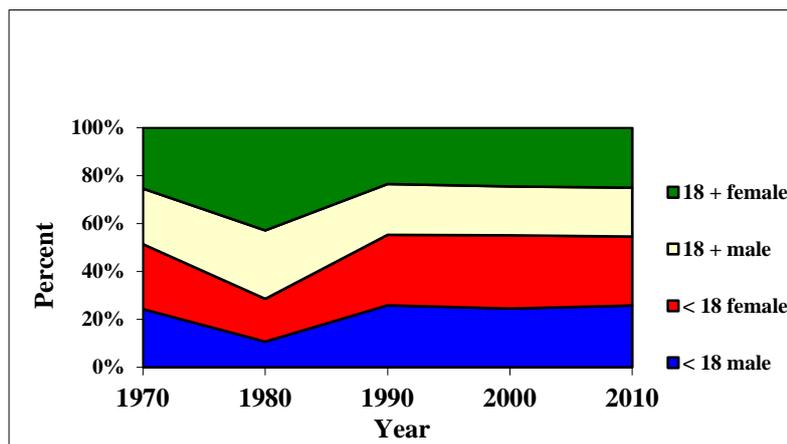


Figure-4.16: Population distribution by broad age groups in Zahaw Village, 1970-2010

Source: Village Peace and Development Council, Zahaw Village, 2011

Dam and Irrigation projects were established in Taung Kin Yan village which helps better water resources and technical know-how for agriculture work and leads to economic growth. 50% of total population is native and the remains are immigrants from neighboring villages. The data on population for specific villages are shown in a table. In Taung Kin Yan village there was 19.47% of male and 18.85% of female under 18 years old and there was 29.56% of male and 31.8% of female over 18 years in 1970. There was no major changes of population during 1970 and 2000 but the percentage increased in 2010 (17.7% of male and 17.5% of female under 18 years and 30.5% of male and 37.9% of female over 18 years old respectively) (see Table-8 and see Figure-4.17). It is assumed that the low proportion of population under age of 18 years old was due to health education activities on birth spacing by basic health staff in Taung Kin Yan village during 2009. It was also found that one family used to have 7-11 children during 1970 and 2000 and only about 2-3 children in 2010. It was noted that people are aware and practicing of birth spacing in Taung Kin Yan village in 2010.

Table 8: Population distribution by broad age groups in Taung Kin Yan Village, 1970–2010

census/ survey	Broad Age Group								Total Number
	< 18				18 +				
	Male		Female		Male		Female		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
1970	415	19.47	423	19.85	630	29.56	663	31.1	2131
1980	476	19.58	506	20.8	711	29.25	738	30.36	2431
1990	537	19.94	572	21.24	783	29.1	801	29.7	2693
2000	577	20	622	21.57	828	28.7	856	29.7	2883
2010	596	17.7	588	17.5	1025	30.5	1272	37.9	3361

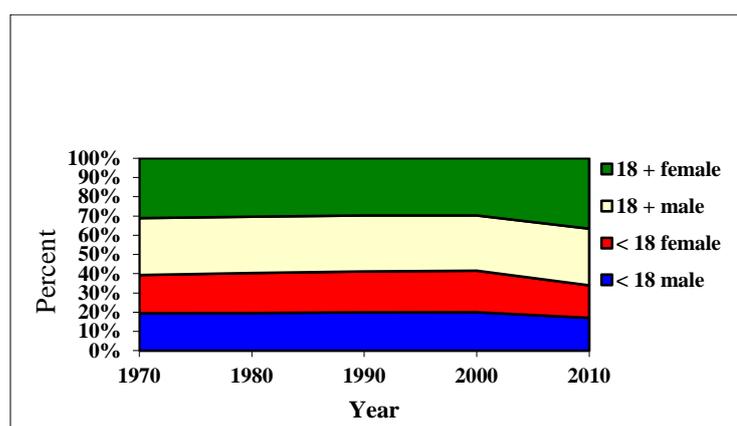


Figure-4.17: Population distribution by broad age groups in Taung Kin Yan Village, 1970-2010

Source: Village Peace and Development Council, Taung Kin Yan Village, 2011

Myauk Kin Yan village accesses water from Taung Kin Yan dam so that agriculture in Myauk Kin Yan village is also developing. In Myauk Kin Yan village, there was 15.48% of male and 15.56% of female under 18 years old and there was 34.75% of male and 34.2% of female over 18 years old in 1970. Total population increased during 1970 and 2010. There was 16.9% of male and 16% of female under 18 years old and there was 33.6% of male and 33% of female over 18 years old in 2000. In 2010 there was 17.4% of male and 16.2% of female under 18 years old and there was 32.9% of male and 33.5% of female over 18 years old. It was found that the proportion of population under age of 18 years did not change hugely in 2010 (see Table-9 and see Figure-4.18).

Table 9 Population distribution by broad age groups in Myauk Kin Yan Village, 1970-2010

census/ survey	Broad Age Group								Total Number
	< 18				18 +				
	Male		Female		Male		Female		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
1970	380	15.48	382	15.56	853	34.75	840	34.2	2455
1980	410	15.5	412	15.6	900	34	920	34.8	2642
1990	904	15.3	512	15.5	1190	36	1090	33	3296
2000	609	16.9	580	16	1211	33.6	1200	33	3600

2010	671	17.4	626	16.2	1270	32.9	1295	33.5	3862
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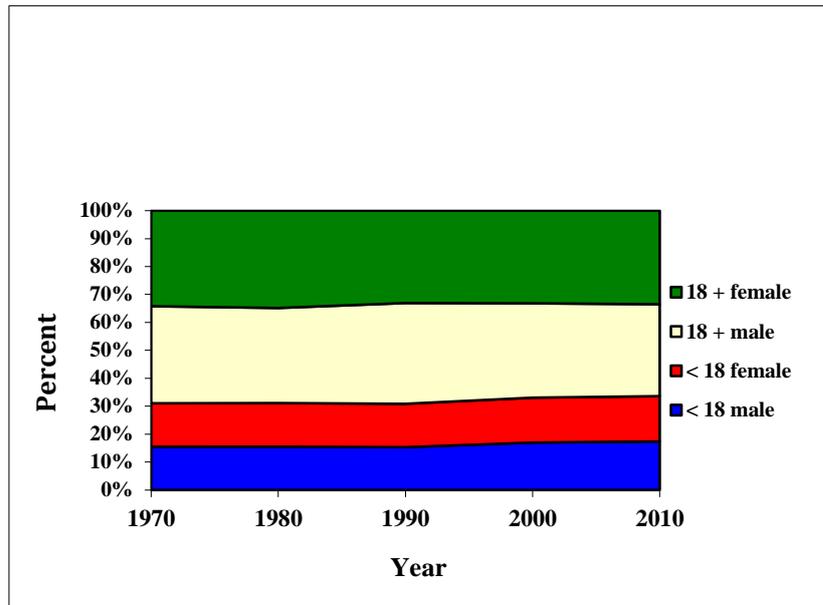


Figure-4.18: Population distribution by broad age groups in Myauk Kin Yan Village, 1970-2010

Source: Village Peace and Development Council, Myauk Kin Yan Village, 2011

Due to better railway transport and communication along Mandalay-Monywa-Gangaw-Hakha and Kalay-Yaymyetni-Gangaw economic situation in Kyaw village also becomes better. In Kyaw Region 50 % of total population is native and the remains are immigrants from neighboring villages. In this village, there was 9.56% of male and 14.8% of female under 18 years old and there was 34.3% of male and 41.3% of female over 18 years old in 1970. The proportion was higher among female population. In 2010 there was 14% of male and 15.6% of female under 18 years old and there was 33% of male and 37% of female over 18 years old. The proportion of population under 18 years in Kyaw village increased in 2010 (see Table-10 and see Figure- 4.19).

Population in Kyaw became higher because of an economic attraction to people. This area situates in the middle of Pontaung and Ponnya mountains where natural resources are plenty including, Wa-u (*Amorphophallus bullbifer*), other forestry products, development projects like road construction, tunnel digging, natural gas exploration. Thus people from other places come together to Kyaw area and work as odd job seekers. A few of local people works for agriculture with small scale acres and only some native people are entrepreneurs. As a result of economic hardship

people had difficulty in accessing birth spacing methods and the birth rate might increase.

Table 10: Population distribution by broad age groups in Kyaw Village 1970-2010

census/ survey	Broad Age Group								Total Number
	< 18				18 +				
	Male		Female		Male		Female		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
1970	110	9.56	170	14.8	395	34.34	475	41.3	1150
1980	130	10.4	170	13.6	425	34	525	42	1250
1990	180	13.3	200	14.8	450	33.3	520	38.5	1350
2000	180	11.6	220	14	500	32.3	650	41.9	1550
2010	256	14	286	15.6	606	33	676	37	1824

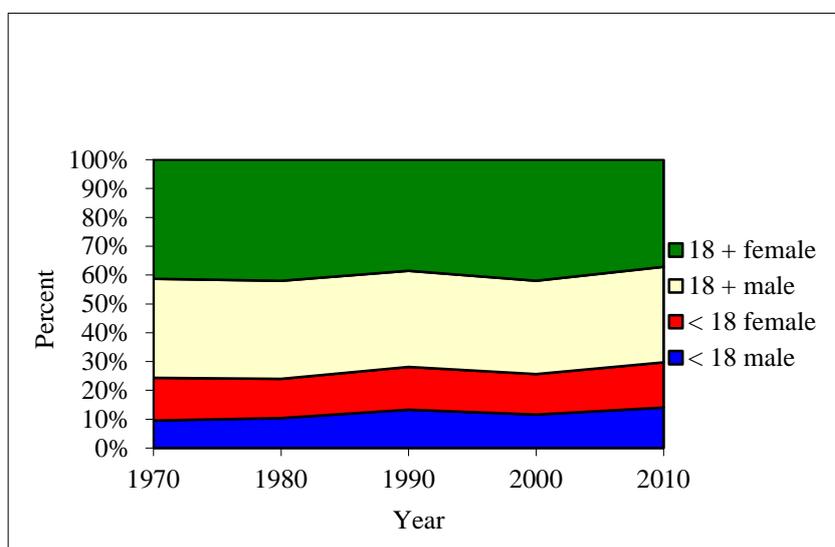


Figure-4.19: Population distribution by broad age groups in Kyaw Village, 1970-2010

Source: Village Peace and Development Council, Kyaw Village, 2011

4.5.2 Marriage

It was found that women got married at 14-16 years of age and men got married at the age of 17-19 years old during the period of 1960-1970. During 1980, it was noted that women became married at the age of 18-19 years and the age of marriage of women increased in 2009 that was about 20-30 years. Age of marriage of men also

increased from 20-25 to 25-35 either. In the past parents were easy to accept the offer for marriage by the side of bridegroom even at early age. Many women become educated recent days and the age of marriage started to switch from younger to older. It was also found from the survey that there was a change in attitude on the meaning of adulthood of women, and the reduction of inter-relatives marriage in addition to an increase age of marriage. In Zahaw village the percentage of marriage among relatives was about 50%. Young relatives fell in love and ran away from home and they finally got married. It was noted that 7 out of 10 couples got married after running away from home. The reason behind was high expense for negotiation to get married which forced them to run away and got married to avoid any disruption of agreement for marriage. So, they practise marriage by mutual consent and elopement. This type of event started to occur in 2000. When a couple came back to the families few days after running away from home and each one went back to one's house. Then both parents came to negotiate and decided the date for wedding ceremony which also included which side of a couple will bear how much of the expenses of wedding. It was also found that 50% of a bride/ bridegroom of a particular village got married with a bride/ bridegroom from other village. They can choose to stay either bride side or bridegroom side according to their economic exploitation.

Monogamy is practised in this study area. There was no big difference of age between couples. A total number of male among 5 villages in 1970 was 4971 and 7734 in 2010 and a total number of female was 5475 in 1970 and 8695 in 2010. The number of single female was higher than single male. About $\frac{1}{3}$ of marriage was arranged by parents and the remaining was based on mutual agreement between partners.

Identification of bride price

The bride price (ဖလားကြေး) goes to parents of bride. This is something like money for breast feeding through bride's parents. Local terminology is different in Kyaw area where it is called the money for respect to bride's parents (ကန်တော့ငွေ). But this money is non refundable after divorce. Parents of the bride get this money forever. The reason might be geographic situation of Kyaw which situates separately from other villages like Zahaw, Shon Shi, Taung Kin Yan and Myauk Kin Yan. In 1975-76 the bride price was about 700-1500 kyat and it is about 200,000 kyat to 500,000 kyat on

average in recent years. But the bride price is as high as 1.5 million to 2 million in some small villages and as high as 7-10 millions in big village. It depends on the level of occupation, richness and also on how much the bride looks pretty.

If someone gets married with a person from the same village, one has to pay 5% of the expense of wedding to the leader of peer group in the village (Kalathargaung) (ကာလသားခေါင်း). If a bridegroom gets married with a bride of other village, a bridegroom has to pay 10% of the expense of wedding to the leader of peer group in bride's village. In addition to that a bridegroom has to pay 5% to the head of village authority for entrance fees to the village. It varies from one village to others. This money is usually used for charity occasions like poor boys who want to go for Novice (Shinpyu), feeding for those elderly who stayed in a monastery for fasting period, building public drinking water place and pot, renovation of road, and expense for funeral for poor.

In the past, a man was not difficult in finding his bride as the bride price was not high. But it is not easy to find an appropriate bride in recent years as the bride price becomes higher and higher. A bridegroom sometimes borrowed money with some interest to offer "a bride price" to get married. Parents of bridegroom need to spend much money for their son's marriage and they have to find and get the money by all means including selling lands and or jewelries. In the past, bride price was usually given on the day of wedding. But in recent years both side of parents negotiate to get consensus on the amount and the parent of bride could give the bride price one month after the wedding. It is sure that the cost of a bride price has increased year after year. The reason for a change in the process and amount of "bride price" is a reflection of social structure change such as more women become educated. More educated women go to town for job to balance gender differences. Parents of bride like to get more money for "a bride price".

Parents of a bride do not want to accept a bridegroom who has unpleasant characters and fewer properties such as paddy field and cash. They also do not want their bride to encounter economic hardship during her married life and look for a bridegroom who has secure job with good income. The parents of a bride sometimes use this money of a bride price for their son when he becomes bridegroom in a near future.

Nowadays, married couple can choose to live either with the boy's parents or the girl's parents that are better-off. So, local people in Gangaw Region practise bi-local

residence. Both couples involve in business or agriculture works of their parents and earn money. After 2-3 years of saving money they leave their parents' house and stay in separate house. It was noted that the first child is born at bride's parent's house. The next babies are usually born at their house.

Traditional marriage ceremony

It is a common practice of choosing auspicious day for wedding ceremony in advance. People think that Saturday is a day to celebrate for Nat (Spirit) and it is not appropriate for auspicious occasion. Thus they usually avoid Saturday for wedding ceremony. A Wednesday is also identified as bad day (a day for insane spirit, "Nat-Yue"). The period of Buddhist lent (War-Dwin) (July, August, September) is also avoided for wedding ceremony. The last Myanmar month (Tabuang) (March) is considered as the month when birds do not build nest (place to stay) so that it is better to avoid that month for starting for a new family (like building a new house). Wedding ceremony is usually held at bride's parent's house / premise.

Before 1960-70 verbal invitation was made for wedding ceremony and a token of cheroot / prickled tea (Hle-Phet) was used for an invitation after that. It was noted that people started to invite for wedding ceremony with an invitation letter in 2000. Nowadays some gifts as a token are given together with an invitation letter for wedding ceremony such as cheroots, a piece of cloth for sewing, sarong (Longyi), and a packet of shampoo particularly for peer groups in the village.

In the past, wedding ceremony was held in the late evening and attendants were served with Jaggery (Palm tree sweet, *Htan-hlyet*). Guests did not need to give a wedding gift. Palm tree sweet was not available much in these area but villages in southern part used to visit the place and sold jaggery (by Bullock-Carts). Merchants from the area namely Htilin came to the study area and sold palm-sweet. Rich villagers bought much and stored and they sold it out when an occasion for wedding ceremony was going to be held. After that period chicken porridge (Kyet-Thar-Mayee) (ကြက်သားမရည်) was served at ceremony.

Nowadays a wedding ceremony is held in the morning. It takes for two days: a day for entry day (Ah-Win-Yet) and main day (Pwe-Kyee-Nae). In the evening of an entry day guys (men) support to build temporary shelter (Man-Dat) and playing loud speaker. Women help preparation and cooking of food for attendants. Bride's parents

served tea, plain tea, and toasted peas. In fact men started to decorate the temporary structure as a shelter for the coming ceremony.

On the main day (Pwe Kyee Nae) at 8 o'clock in the morning relatives from the side of bridegroom come and visit to bride's house where the ceremony will be held with a bride price in a queue. The first person in the queue carries a bowl of bride price and the second one carries prickled tea (Mi-Yar-Pha-Yar-Hle-Phet) (မိရာဖရာလဖက်). And then, the third one carries inner tea (Atwin-Hle- Phet) (အတွင်းလဖက်). When the bride enters the inner room, this inner tea has to be given by the bridegroom to the bride. The person carrying the properties for wedding ceremony must be the eldest married woman in a family of bridegroom. A bridegroom together with his friends enters the bride's house after all relatives in a queue.

When all of them are in the house of a bride, a bridegroom takes a seat on the right side of the bride. A spoke person from the side of a bride starts to pay respect to all and says wishful words. Senior relatives of the bride (Uncle, Aunt and all seniors) are being paid respect by the bridegroom with a piece of cloth for clothing, sarong (longyi). Nowadays tea, cakes, Monhinga (မှန်တင်းခါး), or Kyazanhin (ကြာခံတင်း) are served at the ceremony. For those who can afford serve cooked rice and pork curry. In some villages Nazi Bahraini (Dan-Bauk) is served. The family of bridegroom bears all the cost of wedding ceremony.

A local resident who is 55 years old, a mother of a bride at the wedding ceremony in Zahaw village in 2011 said "My daughter is 24 years and the bridegroom is 23 years old. The bridegroom of my daughter is her 2nd cousin (see Figure-4.20). They fell in love with each other and ran away as they were afraid that parents would not agree. The bridegroom gives 600,000 kyat for a bride price. We do not have much money. We served Mohinga (မှန်တင်းခါး) at the wedding ceremony (see Figure-4.21). Each side boer half of the expense. An invitation was made through cheroot. We spent about 400 cheroots. We invited those groups (Kar-La-Thar) (ကာလသာ) who helped with fetching water, building temporary shelter (Man-Dat) giving them soap and shampoo. An invitation was made one day ahead of ceremony".

A local resident who is 50 years old said "We arranged the wedding of our son in the village in 2008. We contributed 1.5 million kyat "bride price". The bride was a middle school teacher. As she was educated we had to pay much money as a bride price. They did not elope. We served cooked rice and pork curry. We bought 165 viss

(270 Kg) of pork and the other side (bride's family) bought 15 baskets of rice. The couple received 1 million kyat as wedding gift. 400 invitation letters were sent for the occasion. Each invitation card cost 80 kyat. We gave cheroot (local ones) to some guests and about 10 packets of cheroots were spent. Each packet cost 500 kyat. We gave a packet of shampoo to volunteers peer group (Kar- La-Thar)". If a Chin gets married to a Myanmar both types of ceremony are held, both in Christian way and in Buddhist way. The symbol of giving a bride price is also applied in that occasion.

If a man gets married with widow he doesn't need to pay any bride price. There are about 50-60 widows in some villages and even 100 widows in big villages. The numbers of widows are higher than the number of widowers because men worked in the forest (looking for firewood) and got such disease as malaria and died of it. Women used to work household chores and less dangerous. Thus life expectancy among women is higher than a man. Children sometimes do not agree with their moms (widows) to get married again. Thus a widow gets married less than that of a widower. Widows used to work hard to look after her children and is not ready to get married again. A widow usually gets support from her relatives of both sides. Majority believes that marriage after the dead of the partner creates new cycle of life. It was found out that one third of widows get married again.

In a past, people thought that giving birth and having child was a gift of Buddha/ God. A child was identified as a precious thing like jewelries (Yadana). They were not aware of modern methods of contraception. Nowadays people try to practise birth spacing. Majority feels that a man at the age of 25 should get married. The age a girl has got married has also increased.



Figure- (4.20): Bridegroom and bride in Zahaw Village



Figure- (4.21): Mohinga at wedding ceremony

“Hnote-thee, sone-kaut-chinn”

It is a process to protect both a bride and a bridegroom from any harm like spiritual attack. It is assumed that both of the couple might have fallen in love with someone else before. This process helps protect any negative repercussion of previous act. Moreover it prevents an effect of casting a spell on the couple. The process is called “feeding witches”. It is still prevalent in Taung Kin Yan village, Myauk Kin Yan village, Kyaw village, and northern part of Zahaw village but it is no more popular in southern part of Zahaw village and Shon Shi village.

This process is usually taken place during the wedding ceremony and but it is done after the wedding ceremony in Myauk Kin Yan village. The process of it is as follows: two spears are erected on the earth and a shirt of both couples is tied to both spears. Chicken porridge “Kyet-Thar-Mayee” is made after killing one male chicken and one female chicken. A round bamboo tray is hanged between two spears. Two portions of semi-solid chicken porridge are placed on banana leaves on the tray. adding a piece of chicken thigh, head, foot and internal organs in the porridge. All parts of internal organs of chicken are tied with thread. It makes easy to find where the parts are.

After preparation Nat Sayar (Pasone Sayar) recites some words and knocks the tray with wooden stirrer. Then visitors start to consume served food. Then a Nat Sayar buries one portion of the porridge at the one corner in the premise. He puts another portion near the roof that situates directly above the staircase. He then takes the second portion in the evening and put it in bamboo tray and leave it at one of the cross road in the village to let witches eat.

The process is a bit different in the Myauk Kin Yan village though main principle is the same. There are four portions of porridge placed on bamboo tray. Four portions represent four directions (east, west, north, and south). Nat Sayar invites a female spirit leader from each direction. He has to say “we invite you to the wedding ceremony. Please consume food being served. Please do not make any harm to us”. Then he brings each portion of porridge and buries in the earth at 4 corners of premise. The process ends after burying 4 portions of porridge in the earth.

In southern Zahaw villagers do other praying act instead of feeding witches. They sprinkle holly water with Eugenia leaves together with Bermuda grass (Mye Zar-Ywet) in the early morning. It is called Sein-Yee-Pyan (sprinkling holy) which was introduced to the area in 2002. Fifty two years old local man said a pair of chicken was killed for the sake of healthiness and happiness of newly-wed couple. He mentioned that the conduct of feeding witches is no more popular in this village because a newlywed couple lives long even they do not do this act. In town there is no such thing. That is why sprinkling holy was prayed instead of this act. Eugenia leave is to ease temper, Bermuda grass is to make bond stronger. It is essential to pay 1000 kyat and one sarong (longyi) to a person who organizes and prays for the act. A bride has to bear this cost. If they cannot afford they can use gift money.

4.6 Health and Health care

4.6.1 Birth spacing

In 1980, there was no practice of modern birth spacing before health program started in the study area. There was traditional way of birth spacing and terminating pregnancy about 20 years ago. In the past induced abortion was done by inserting and stirring with iron rod which was used as a shaft of umbrella. Stirring the uterus till the bleeding comes out from the vagina. It was usually done three times. The shaft of umbrella was sharpened before it was used to induce abortion. There was one incidence that *Lethe* (လက်သဉ်) (traditional birth attendant) was doing induced abortion indiscriminately many times so that midwife from that area reported to local authority and warned the *lethe* (traditional birth attendant). Local herbal roots which are called “Taung-Kya ott (*Stephania Venosa*)” are also consumed after mixing with local spirit (alcohol) to induce abortion (the color of that root is reddish that look like blood). After 1990 practice of modern methods of birth spacing, IUCD (intrauterine contraceptive device), depot injection, and oral contraceptive pills have been used. There were 3 maternal deaths in 1993-94 due to unsafe induced abortion in the Gangaw Township.

Some people are still practicing traditional ways to induce abortion such as consuming herbal blood tonic (Kathy-Pan-Thwei-Zei) and putting pipe into the vagina. They take two packets of herbal blood tonic (Kathy-Pan-Thwei-Zei) once they realize that they become pregnant. It was evidenced that the baby was born with a pipe on its part of the body like eyes, scrotum. There was high child mortality in the past.

Thirty eight years old native woman from Shon Shi village said that she underwent sterilization in 2009 at government hospital with affordable cost. She now has three children but her health is not in a good status. She explained that there was very short period between two pregnancies. "I started to be pregnant when previous child became one and half year old. My husband encouraged me to practise birth spacing with one of the modern methods as my health is going to worsen. I was suffering from bleeding from vagina after I underwent depot injection. I felt very hot when I took oral contraceptive pill. I never use condom. Thus I underwent sterilization". Modern method of birth spacing like IUCD insertion, and using oral pills was mostly introduced in 1995, depot injection was mostly used in 2000.

4.6.2 Traditional way of birth

Lethe is still working in the area for delivery cases but more *lethe* (လက်သည့်) was working before 2005. *Lethe* used to push pregnant woman's abdomen to change baby position. First baby is usually born at woman's parent house. The following deliveries are conducted at husband's parents' house. If there is difficulty in giving birth for 4 days woman should take off her wedding ring and ear rings (particularly for those ear rings with screw type). Moreover doors, and windows are left open, leave the container lid open to help easiness in giving birth. They also believe that reciting Buddha's teaching (Ingulimalar sutta) may help easy in delivery of baby.

The umbilical cord is cut only when both baby and placenta are brought outside the womb of mother as they think life exists in a placenta. Three threads are made ready before the delivery is finished which is going to be used to tie the umbilical cord before it is cut. *Lethe* supports bathing the mother after delivery and she puts sesame oil and turmeric on mother's body. Newly born baby is fed honey. After three days the baby is fed meshed steamed rice and honey. If newly born baby does not cry the placenta is put in warm water. The baby is hanged upside down and slap it's back to start crying.

Post partum mother is fed a tonic mixture of turmeric powder, warm water, and toasted salt about the half size of teacup two times a day for one month. It is said to make mother's blood purified. Post partum mother is allowed to take shower but cannot touch soap for at least one and a half month. Post partum period is identified for one week (that is not compatible with medically identified 45 days). Mother during post partum period has to eat warm steamed rice with roasted salt for a week. She is not allowed to eat oil. Oil is said to cause eye problem and is avoided for one month. Nowadays women eat fried chicken, fried fish, steamed chicken, boiled egg.

The act of The-Je-tin (massage on abdomen) is done every three days. The abdomen is massaged to change from old blood to new blood. It may cause coming out old blood. A kind of herbal tree called Se-kalon (*Martynia annua*) is pounded and mixed with salt to make it paste which is applied on vulva of woman to help healing of wounds. The vulva is also washed with warm water two times a day for a week.

Another herbal medicine called "Mee-Kyasay" (မီးကျဆေး) is consumed to help better production of breast milk. Mother also drinks cow's milk, soup of gourd, soup of ash pumpkin, surplus water of cooked rice (that is drained off while rice is being cooked

when it is not needed) to help more production of breast milk. Well-off mothers consume soup of pig leg, or fish. All windows of the house are left closed to prevent entering outside air to make a woman warm. The mother also wraps and covers her body and head with sweater or blanket. Perception is that fresh air may make her ill. Post partum mothers perceive that if they sleep in lateral position there is no breast milk so that mother should lie on her back.

If mother is not able to produce breast milk a child is fed with mixture of cooked rice. The process of making this type of cooked rice is as follow; mix steamed rice and surplus water of cooked rice and cooking oil which is placed in the middle of cooking rice for few minutes. The cooked mixture is fed to a baby. It helps baby stronger. Gold power is now popular as milk powder which helps growth of a child. If a child suffers from fever or wound local traditional medicine called “SatuRakha” is given. After a child suffers from illness, it is to pray for Nat (good spirit) with a bunch of banana and coconut in a bamboo basket. A person (Nat Sayar) is invited to organize praying for recovering sick child. The act includes offering prickly tea mixed with cooking oil, one plate is placed in front of the house and another one is at the backyard. An organizer feeds and prays late spirits (Nats) of both sides.

Some vital statistics for 2006 is as follow: crude birth rate was 13.2/1000, maternal mortality ratio was 4.2/1000, and the rate of abortion was 7.4/1000. These rates changed year after year. In 2010, crude birth rate was 15.9/1000, maternal mortality ratio was 1.4/1000, and the rate of abortion was 3.0/1000 (Table-6).

4.6.3 Mortality

It was learnt from the existing data that there were many death cases of malaria in 1998 (Tharlin Rural Health Center ,RHC). It was noted that infant mortality rate was 13/1000 and crude death rate was 6/1000 in 2000 (see Table-11). Mortality rate from malaria was high before 2000 but it has reduced after implementation of malaria project in 2007-2008. This project includes testing the presence of malaria parasite in a patient, giving treatment free of charge when it is positive so that the rate reduced afterwards and it is now nearly disappeared. There were about 100 cases of dengue fever in Zahaw village during 2009. Malaria control project gives service like spraying anti malaria insecticide. Nowadays prominent health problem is respiratory infection called acute respiratory tract infection (ARI). It was noted from the

interview that people think ARI is common because there is plenty of dust and because animals are bred without separating from people. They said there were about 2 cases of dead of children who are under one year old per year due to pulmonary problem in 7 villages in Myauk Kin Yan village tract. ARI cases increased after the reduction of malaria cases (see Figure 4.22).

There are immunization activities in study areas which including vaccinee for measles, diphtheria, pertussis, tetanus, hepatitis, and polio to one month old babies. Another dose for diphtheria, pertussis, and tetanus is given at the age of two and a half month and three and a half month. The immunization is given free of charge. Due to immunization activities infant mortality rate (IMR) has been reduced and the death of under-5 years children has been reduced (IMR was 9.4/1000 and under-5 mortality was 11.9/1000). In 2010 crude death rate was 5.4/1000 (see Table-11).

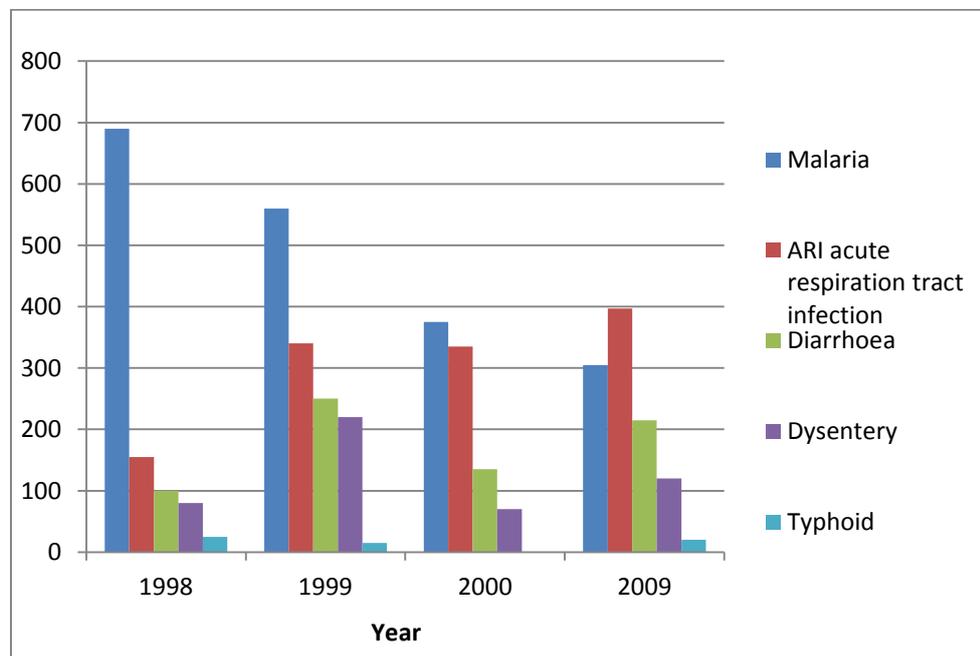


Figure-4.22: Comparison of 5 most prevalent diseases by years in Gangaw Region

Source: Tharlin Village R.H.C, 2011

Table-11 Vital Statistics of Gangaw Township (2000-2010)

Indicator \ Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Crude Birth rate	21	22.5	23.5	21	15.6	11.7	13.2	13.5	16.9	16.8	15.9
Crude death rate	6	7.8	7.1	5.9	4.6	5.5	4.5	4.6	5.3	5.6	5.4
Infant mortality rate	13	25.7	23.4	20	31.5	46.1	18	28.2	24.6	17.9	9.4
Under 5 Children mortality rate	No data	36.4	36	35	52.8	60.1	30.6	37.5	30.3	25.2	11.9
Maternal mortality ratio	No data	0.8	No data	No data	0.9	3.0	4.2	1.5	0.5	1.9	1.4
Ratio of abortion	No data	No data	No data	No data	1.4	4,3	7.4	3.6	3.0	3.3	3.0

Source: Report of the Orientation Meeting on Pubic Health Care Activities in Gangaw Township, 2010

4.6.4 Hospital and dispensaries

The construction of Tharlin RHC was started in 1971-72 and renovation was again done in 2010. It was noted that the project for hospital construction in Kyaw Region was started in 1998 with the support of cement and corrugated sheet for roof by Ministry of Railway Transportation. Local people contributed other necessary materials. Each family contributed one long piece of wood. The project included construction of two staff houses, operation theatre, and radiology room. There were about 3 senior nurses and 3 helpers at the beginning of the project. The hospital is 16 bedded and one doctor has been posted since 2000. Till now there has been 6 doctors already posted in the hospital one after another. Human resource of the hospital composed of one doctor, one senior nurse, one junior nurse, 5 nurse aids, and 4 other staff.

There is now about 3 million kyat of hospital fund which is used to buy medicines for the hospital. A charity association for funeral services was established in 2009 and it helps those who are helpless and died in car accident. The road in the area is so rough and mountainous that there are many car accidents every year. Every village has youth association which helps with social activities in the village.

RHC in Myauk Kin Yan village (see Figure -4.23) was established in 2009. There has been one health assistant, one midwife at the station and 4 midwives being assigned in villages and 2 other staff in the RHC. In 2002 treatment for TB and malaria was started giving pills free of charge. According to villagers HIV used to be high in the villages but it reduced after the implementation of health education on HIV in 2008.



Figure- (4.23): Rural Health Center in Myauk Kin Yan Village

4.6.5 Some traditional belief and practices on health care

In the past, villagers usually perform some traditional practices to protect the village from any diseases and illnesses. An organizer (Nat-Sayar) was requested to do spiritual act and to recite some sacred words (Nat-Puzaw) at special places where the shrine was situated (Nat-Sin) (see Figure-4.24). They offered chicken and pig to the spirit to cure diseases and to protect themselves from any harm of bad spirits. Villagers were treated with locally available herbal roots for febrile illnesses. Though health problem was serious they could not go to hospital (in Kalay and Gangaw) due to transport and communication barriers. They also had difficulty in sending difficult labor cases to nearby hospitals due to difficult transportation resulting in high mortality rates.

Up to now, people are still practicing traditional way of treatment though western medical services are easily available. People practice both western type of treatment and traditional way simultaneously. One health staff of North-Khayan said that febrile illness is sometimes due to bad omen. The practice of clearing bad omen is called "Ahpaw-wunshin Dea" (အပေါ်ဝင်ရှင်းတယ်). Health staff also treat the patient through western medicine and also tells them to go worshipping Nat (spirit) to cure illness.

It was also observed the performance of spiritual type of treatment by Nat-Sayar to cure a case of paralysis. They prayed for a lady spirit (Ahmayyeyin) by offering cooked rice, fried fish, red moun-hsi-gjo (fried sweet pan-cakes made from glutinous rice) and white (motesikyaw) (မုန့်ဆီကြော်) together with Bermuda grass (Mye-Zar-Ywet) (see Figure-4.25, 26). They packed all food items in the banana leaves and buried in the backyard of the premise. If the illness is serious they also offer pig to spirit (Nat). In olden days, villagers had to deliver 3 visses (4.9 kg) of pork to the organizer (Nat-Sayar). Nowadays, they have to give one hand of pork to the Nat-Sayar. These types of practices are still observed in villages.

Modern medicines have been introduced these days. Patients usually come to the hospital only after undergoing different types of treatment, particularly traditional ones. People in this region get locally available traditional medicines as they are not expensive and abundant. "Yaw" Region is also popular for plenty of herbal medicinal plants. It was learnt that nearly two-third of people are treated in combination of traditional medicine and western medicines.

When a child is sick, local herbal roots, and traditional medicines are used. The leaves of Ngayan-Padu (*Clerodendrum indicum*) are mixed with coconut oil and is applied on the nose of a child if a child suffers from running nose. They believe it could cure the disease. Local people believe that less cases of snake bite is due to the presence of shrine of the spirit “Ahmayyeyin Natnan” in the area. Another reason for less snake bite case is that people used to bring a dog whenever they go into the forest and the dog acts as a guard from snakes.

Local people think that it is costly to get modern medical treatment: transport charges, cost of medicines and consultation fees of doctor. Traditional healers said illness is due to fate, due to excess of hot-cold food and so forth. Its treatment goes in line with own causal factor. Most elderly do not visit western medical practitioners. Children are also not brought to the clinic and hospital due to traditional belief resulting in high child mortality rate.



Figure (4.24): Nat-Sin in Zahaw Village



Figure (4.25): Making offering to the Ahmayyeyin



Figure (4.26): Offering Nat with Bermuda Nat grass (Mye-Zar- Ywet)

CHAPTER (5)

ECONOMIC RESOURCES AND SUBSISTENCE PATTERNS

Most people in Gangaw Township live on agro-based economy. Paddy cultivation, horticulture, livestock breeding, growing vegetables and crops on sandbanks are their main agricultural and livestock activities. Catching fish for villages near rivers and creeks, hunting in Chin villages are often quite common. The Bamars (Yaw) in Gangaw Township conserve their various resources. They enlarge crop plantations and crop varieties. Due to the increase of migrants into the area, more agricultural products are produced for enough consumption in the locality. Appropriate varieties of fruit trees and plants in accordance with the soil type have to be grown in paddy fields, farmlands and sandbanks for their living.

5.1 Environmental manipulation and resource management

Environmental manipulation is commonly seen in farming system more than other systems, that is, finding, manipulating and reclaiming agricultural farmland. In Gangaw Township, land reclamation need to be conducted to replace the lost land areas due to railroad and motor road construction, and migrant (human) settlement. As a result, farm land areas in most study villages have increased a lot year after year. In Myauk Kin Yan village, the increase in farm land area is greater than other villages as it has the potential to extend the farm land. In Kyaw village, the potential land area to make room for farms is limited, and so its farmland area stands still.

Another thing is local traditional belief in Nats (spirits). It is in fact dangerous to get to Gangaw region through the Pontaung and Ponnya mountain ranges. Due to natural environmental settings, the roads that have been constructed around the mountains are nearly always with deep valleys on one side and high rock walls on the other. It is therefore to pay respect to “shrine for an Ahmayyeyin nat” that is situated in the Pontaung-Ponnya (see Figure-5.1, 2) first before starting to make a journey so as to travel without causing any accidents.

Moreover, “Paddy field spirit” (*Le nat*) is to be respected twice a year (before and after ‘lent’). On full moon day of Thadingyut, the whole villagers of Gangaw region pay respect to “Ponemakyi nat” with some rice, one or two pieces of fried fish, fried sweet pan-cake (*motesikyaw*) (မုန့်ဆီကြော်), a kind of meat curry (a little) and one

banana in the field. In Nattaw (November), when the ears of paddy began to appear, the “paddy field spirit” is also offered with rice and curries being put on the banana leaf to obtain more farm produce. Moreover, the practice is also carried out after harvest on the heap of paddy sheaves with steamed glutinous rice, boiled egg (or) fish curry, chanting suitable mantras by the head of household himself. After winnowing in the morning, whosoever can eat the offerings. “*Ponemakyi*” (ပုန်းမကျီ) practice is also done to boost the production of rice every year.

If there is no rain, the tug-of-war ceremonies were used to be practised. It is believed that there will be rain by doing so. It has been practised as part of their life style recently. It is therefore observed that religious practices regarding agriculture are still being observed in the society.

Though the practice has still being observed, the belief in super powers has become deteriorating a lot compared to previous times. Development of communication in the area, trading and business dealings with neighboring localities and migration of laborers are the main reasons for the change of cultural identity of the community.



Figure- (5.1): Shrine for an Ahmayyeyin nat in Pontaung

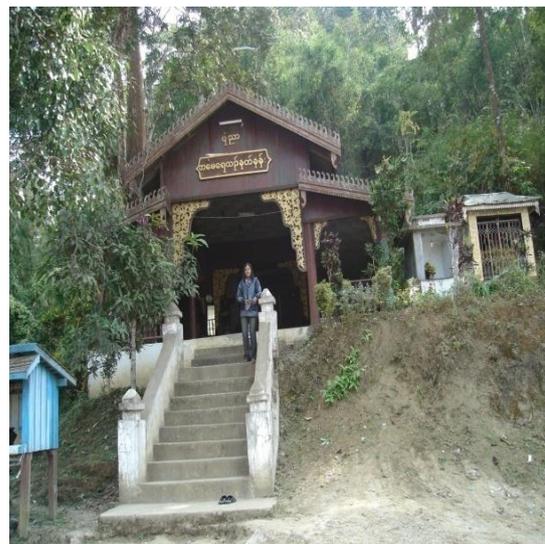


Figure- (5.2): Shrine for an Ahmayyeyin nat in Ponnya

5.1.1 Alluvial Sandbank

Bank erosion on one side of the river and forming sandbanks on the other are common due to heavy rainfall and change of direction of the river. These alluvial sandbanks are divided among villagers to make room for farms. This alluvial soil (sandbank) is called “*Thaunghtomye*” (သောင်ထိုးမြေ).

Provided that the sandbank forms at the place right straight of the original farmland, the owner of that farmland owns it. The farmer who receives the sandbank has to offer fund for the village and serve meals to the village authorities. In Shon Shi village, such sandbank is formed for about 1 – 1 ½ acres per year.

Zahaw village is situated beside the Zahaw creek and sandbank (see Figure -5.3) forming is quite often. Due to the change of current direction, it is estimated that there will be about five acres of farmland erosion and five acres of sandbank forming every year. In the age of Revolutionary Council, party fund was collected by growing crops on those sandbank areas. Villagers were to contribute labor in the farm work.

Later, the sandbank has been reserved for village fund. The sandbank formed between the two farms of the separate farmers used to be confiscated as the village owned. The money thus earned from it is usually used as school fund. Parents of students contribute their labor whenever needed. The products of crops are sold to use in repairing the school, and providing awards to the poor students.

The delivery system of sandbank depends on the soil erosion. The farmer whose farm erodes this year will be delivered next year when the sandbank forms at that place. If there are two persons whose farms erode they will have to share the sandbank proportionately, depending on the farm acres eroded. In Zahaw village, various peas and beans were grown on sandbank, but peanut and butter bean are now grown with corn as the multi-crop. After the harvest of peanut, water melon and kidney bean are also sown.

The Myitthar river annually eroded the farmland of Taung Kin Yan and Myauk Kin Yan villages for 1 ½ – 2 acres. After 10-15 years, sandbank appeared on another place. The sandbank was recognized as the party-owned farmland in the age of Revolutionary Council. The villagers contributed their labor and one-third of the profit went to the party and two-third was used as the village welfare fund. In the Age of SPDC, the sandbank was delivered to the landless systematically based on the priority list. First priority was poor landless, the second one was poor farmers and the third one was the farmers whose original farmland was quite straight to the sandbank.

Of the five villages in the study area, Shon Shi, Taung Kin Yan and Myauk Kin Yan villages have a few events of sandbank forming; but Zahaw village has more events of erosion and sandbank forming. For Kyaw village, such event is scarcely seen as small creeks only exist near Kyaw village. Nevertheless, people try to manage their environment to the best of their ability to boost their living conditions socially, economically and environmentally.



Figure- (5.3): Sandbank in Zahaw Village

5.1.2 Farmland types (varieties)

There are three types of farmland in Gangaw Township: paddy land, farmland and sandbank. Aluvial soil is the first grade, clay soil the second, and (indaing) (အင်တိုင်း) black cotton soil the third. Of the soil types in Shon Shi village, Kywekyolai (ကျွဲကျိုးလယ်) and Letizu (လယ်တီစု) exist near the villages, and the dung of cattle, fowls and pigs becomes manure, draining along with the rain water into those fields. Without inserting fertilizer into those fields, 100-110 baskets of paddy yield per acre can be produced. As those fields are very fertile, and buffalos, thus, need to work very hard until their legs are broken, those fields are called “Kywekyomyay”(ကျွဲကျိုးမြေ). In those fields, double cropping is common. The current price of those fields is 10 lakhs per acre. The owner who owns 10 acres of land is the one who owns most. “Oopyilezu” (အိုးပြည့်လယ်စု) and “Thayetto- lezu”(သရက်တိုလယ်စု) are medium-ranged type of farmland. “Myechanung -le” (မြို့ချောင်းလယ်) and “Monsple” (မုံစပဲလယ်) are the farthest fields from the village and the poorest type of farmland. As soon as the rainy season beings, the farmers need to move to the field to do farm work. The yield per acre of such field is about 25 baskets (1150 pounds) of paddy. Some poor fields are used for pasture.

In Zahaw village, there are three types of land: paddy land, farmland and sandbank. Minkhinetaw, (မင်းနိုင်တော) Kyutaw,(ကျူတော) Inntaw,(အင်တော) Moelinthar (မိုးလင်းသာ),

and Katainkonetaw (ကတိန်ကုန်းတော) are first grade fertile farmland areas. The second grade ones are Tinthan (တင်သံ), Oopout (ဦးပုတ်), Khotemee (ခုတ်မီး), Seigyí (ဆည်ကြီး), Minlinkaing (မင်းလင်းကိုင်), Kyeebaung (ကျီးပေါင်), and Monekhontaw (မုံးရုံးတောင်). The poor one is Ngatetpyartaw (ငတက်ဖတော) that is used for dry sowing with a total area of 3.5 acres. In this area, dry farming of paddy, mustard, gourd, pumpkin, roselle, tomato, watermelon, etc. are common.

The farms that exist in Kin Yan (Taung) village are Chaungphyar(ချောင်းဖျား), Aukthaung (အောက်သောင်), Yanshinzu (ရှေ့ရှင်စု), Taungtaw (Dipa) တောင်တော (ဒီပါ) , Myauktaw (မြောက်တော), Alekyun (အလယ်ကျွန်း), Chindaiktaw (ချင်းတိုက်တော), and Shartaw (ရှားတော). In years when the Myitthar River flooded, Shartaw farm used to be deposited with alluvial soil. Aukthaung is also fertile. Now, as all farmlands are irrigated areas, they are all productive, even the then poor ones become productive.

The room for farms is always increasing in Myauk Kin Yan village. Virgin land areas are cleared for farming in the years when rain is plentiful as there are virgin land areas near the village. Winter crops are sown on the sandbank. In Kyaw village, only two types of land exist: paddy land and farmland. Paddy and green peas are generally grown in “Kyitmyay” (ကျစ်မြေ), the best type of farmland. Gourd, aubergin, and green pea are grown on “thewetkhaukmye” (သံဝက်ခေါက်မြေ) (half sand and kyitmyay with some content of alluvial soil). The poorest one is sand land that is only utilized to grow bean intended to eat its sprouts only.

5.2 Irrigation

There are different types of irrigated farming in Gangaw Township. The first one is farming using the water seeped naturally or the water flooded. This type of farming has been used since 1962 and before. Moreover, dams are constructed to store water. Real irrigated farming includes building dams with its water diverting channels, canals, wells or other ways on purpose to irrigate water into fields. Water from streams and rivers will be diverted into canals and sent up to far away fields. Forty per cent of world food production comes from the sixteen percent of farmland production, that is, irrigated farming (Sultan, Mark. Q and Anderson, E.N., 2010).

5.2.1 Rice varieties

Of the five study villages, Taung Kin Yan and Myauk Kin Yan villages grow paddy most, and so not only they have enough rice for consumption but also they sell surplus rice to other localities. The remaining three villages buy rice from Monywa, Pakokku and Kalay as they do not produce enough rice for their own consumption. After the completion of the Taung Kin Yan dam, Taung Kin Yan and Myauk Kin Yan villages have used the irrigated water for farming. The problem is to get hold of water. But management of water will lead to better production of crops.

The rice varieties sown in the area are Ngashunnu (ရွှန်းနု), Chinlay (ချင်းလေး), Taunghteikpan(တောင်ထိပ်ပန်း) and Yathay (ရသေး) species that are sown as double cropping. At present, in place of Taunghteikpan, Manawhari (မနော်ဟရီ) and Palaunggya (ပလောင်ကျား) have still been grown in Myauk Kin Yan village. The species currently being grown are Ayeyarmin(ဧရာမင်း), Shwetoe (ရွှေတိုး), Manawthukha (မနောသုခ), Yarkyaw (ရာကျော်), Shwewatun (ရွှေဝါထွန်း), Sinthukha (ဆင်းသုခ), Ayeyarsun (ဧရာဆန်း), Manawhari (မနော်ဟရီ) and Shwebo (ရွှေ ဝါ)(1) and (2).

Ayeyarmin and Shwetoe species are guided by the Agriculture Department after 1988. In 2000, Mnawthukha species was distributed by the agriculture Department. Yarkyaw and Shwewartun species are drought prone species fittest for growing in the area: those species are a bit rough but people like for its larger volume after being cooked. Shwetoe species is both flood and drought prone, too; it originated from Kalay in 2007, and was grown most in 2008. Shwebo (1) and Shwetoe have the same yield per acre, but Shwetoe produces more rice after being milled.

In 2008, Pawsanhmwe (ပေါ်ဆန်းမွှေး) variety was started growing in Shon Shi village totaling 10 acres of cultivated area, intending to offer “swam” (rice) to monks and for own consumption by the rich men in the village. But farmers dislike it because it is easily digestible and it takes a lot of water as well as two weeks older than Yarkyaw. Ayeyarmin variety was started growing in 2009 but is only grown for household consumption as it is less productive in yield.

Broadcasting paddy

Paddy seeds are usually broadcast in the months of June, July (Nayon, Waso). It is to harrow from 5-8 layers of tracks (see Figure-5.4). First, two layers of tracks using a seven-toothed harrow are to be harrowed in order to remove grass and small plants and it is left for 3-4 days to make the soil harrowed black. Then, using a three-toothed (setting teeth in the holes of both ends and in the middle) harrow, three layers of tracks must be harrowed, leaving it at the water level 9"-12", letting it remain for 3-4 days. After that, using four-toothed (setting teeth alternately) harrow, three layers of tracks must be conducted, known as "finishing tracks". Then it is needed to smooth the surface of the nursery using a piece of wood the size of a harrow, being drawn by the bullocks: letting the water level remain 9"-12". The seeds are to be broadcast afterwards, and three days later, water must be let out. After a month, the seedling is ready to be transplanted.

The Taung Kin Yan dam authorities recognizes January as the duration of sowing seeds to grow irrigated summer paddy for a total area of 1200 acres: 500 acres for Taung Kin Yan village. Water is delivered for seven days during the period. The work of sowing seeds is done collectively in the area of land (5 acres) closed to the water. All the farmers are to carry out the task of sowing seeds in a participatory manner. Tax for water delivery, charges for harrowing and chemical fertilizer, cow dung and other manure are to be shared on the basis of acres of farmland owned in a united manner.



Figure- (5.4): Layers of tracks harrowed by buffalos

Paddy transplantation

While the process of sowing seeds is being made, the fields that are to be transplanted must be prepared simultaneously — as the stubbles of old plants are needed to be rotted (see Figure-5.5). The soil preparation process is just like the same as that of sowing seeds. Transplantation process generally takes place in July and August. In Shon Shi, Zahaw and Kyaw villages it takes place up to July, August and September, depending on the availability of rain water and creek water. Taung Kin Yan and Myauk Kin Yan villages enjoy irrigated water of the Taung Kin Yan dam.

When the seedlings transplanted are regenerated, 8" of water level are needed in the fields — the water level must be adjusted thus. When the ears of paddy began to appear, the water in the fields is to be let out, the process known as letting out productive water. It is estimated that it is in full formation of grain provided that the soil in the field can be rolled into a pellet although no water is available at that time.

In olden days (when the Taung Kin Yan dam was just completed), the hollow trunks locally available were used to irrigate water into fields. This use of hollow tree trunks (see Figure-5.6) was inconvenient causing great loss of water. Thus, in 2009, plastic pipes were substituted instead. In Kyaw region, water pumps were used for irrigation, causing great cultivation expenditure, and in drought years, causing decreased yields.



Figure- (5.5): The stubbles of old plants



Figure- (5.6): Hollow tree trunk used to irrigate water

As per the 60 year old Taung Kin Yan villager, the yield per acre decreased from 70 to 63 baskets (1basket= 46 pounds) of paddy, 35 to 15 baskets (1basket=72 pounds) of glutinous rice due to the drought in 2009. The farmland areas far away from water sources were worse than this. According to the 65 and 68 year old Myauk Kin Yan villagers, the yield per acre last year was 80-100 baskets (1basket= 46pound) of paddy, but in 2009, the 5.5 acres of farmland produced only a total of less than 100 baskets (4600 pounds) of paddy. Moreover, due to heavy rainfall when paddy fields were harvested, the Myitthar River flooded for three nights, damaging the plants in that area. In brief, there was no enough rice for the whole village in 2009. Rice had to be bought from Kalay. In 2010, most of the paddy fields were damaged by heavy rainfall and destroyed by rodents (rats).

Of the five study villages, Myauk Kin Yan and Taung Kin Yan villages were not much affected by the drought due to existence of the South- Khayan dam. Taung Kin Yan village has enough rice for family consumption even though there occurs drought, but not for Myauk Kin Yan village that does not fully avail irrigation water. So the villagers have to sell out other crops to buy rice for family consumption. The three remaining villages suffer a lot from adverse weather as they have to depend on unreliable rainwater.

The farmers in Shon Shi village own 5 acres of paddy land, 2 acres of farmland and 2 acres of sandbank utmost; in Zahaw village, 10 acres of paddy land, 20 acres of farmland and 20 acres of sandbank; in Taung Kin Yan village, 20 acres of paddy land, 50 acres of farmland, and 10 acres of sandbank: In Myauk Kin Yan village, 50 acres of paddy land, 80 acres of farmland and 5 acres of sandbank; In Kyaw village, 5 acres of paddy land, 2 acres of farmland, and no sandbank at all.

The following figure shows the land use status (paddy land, farmland and sandbank) of Taung Kin Yan village after being fed with irrigated water during 1970-2010.

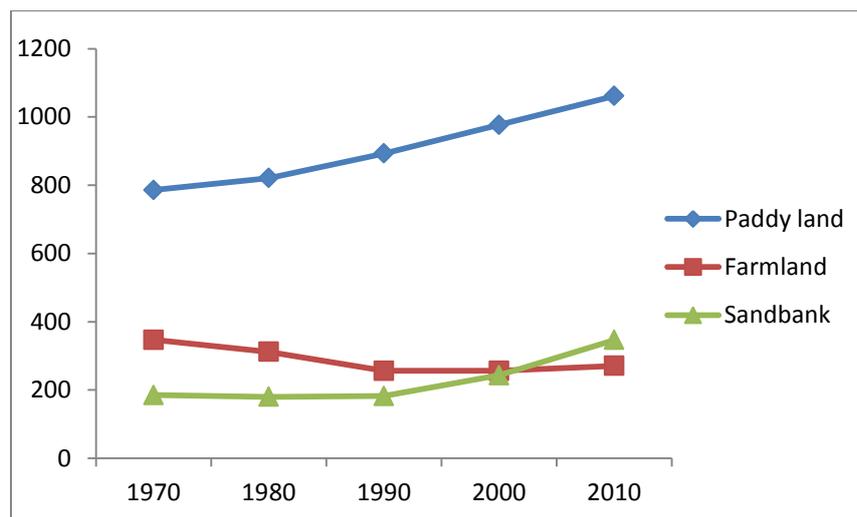


Figure- 5.7: Landuse status of Taung Kin Yan Village

Source: Village Peace and Development Council, Taung Kin Yan Village, 2010-11

In Taung Kin Yan village, the transformation of landuse from farmland of paddy land increased during 1970-2010. In 1993-94, when the Taung Kin Yan village dam was completed, paddy land has increased up to 270.68 acres (see Figure-5.7). The increase in the sandbank is the result of diversification of rivers that deposit alluvial soil.

The change of the landuse pattern of Myauk Kin Yan village, from 1970 to 2010, is the increase in area acres of paddy field, farmland and sandbank. In 1980, the significant increase is seen doubled than in 1970 (see Figure-5.8). The reasons for this are the construction of the hand-made Taung Kin Yan development dam, and the existence of virgin land near the village in older to make room for farms.

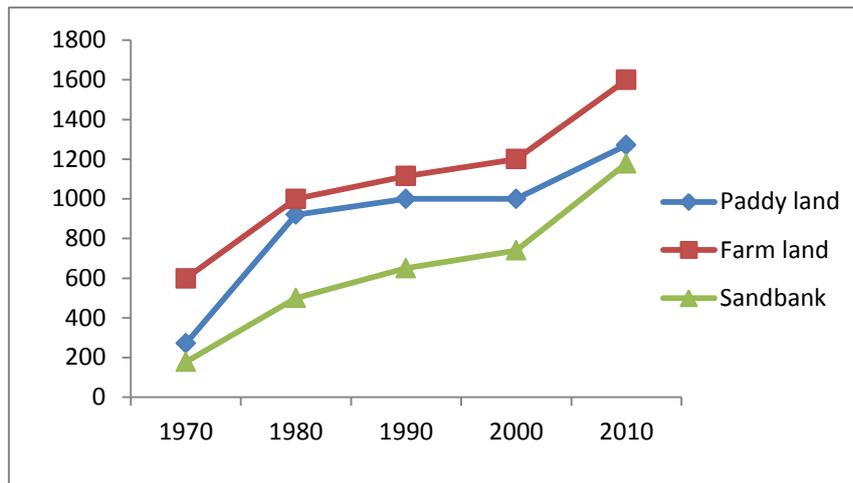


Figure-5.8: Landuse status of Myauk Kin Yan Village
Source: Village Peace and Development Council, Myauk Kin Yan Village, 2010, 11

5.3 Dry farming

Of the five study villages, the four villages, except Taung Kin Yan village, practise dry farming to some extent. Having many acres of cultivated land area, Myauk Kin Yan village does not receive enough irrigated water from the Taung Kin Yan dam forcing them to practise dry farming up to now. It is required to start ploughing for dry farming, and then it is to plough again when rain comes.

For the first time, two layers of tracks are to be applied and by letting it for 2-3 days, the weeds become rotten. After that, six layers of tracks need to be conducted. Afraid of being dried, the fields not getting the rain, seed broadcasting is sometimes to be done without getting time for ploughing. After 2-2 ½ months later, the seedlings need to be fertilized. If broadcasting work is done in June, the seedlings grow up to over (9) inches. To have the seedlings one and half inches apart, thinning work is to be done applying 4-6 layers of tracks. During the thinning process, five carts' loads of cow dung are to be inserted. In dry farming, it is needed to conduct weeding process one and half a months later.

In Shon Shi village, paddy was not grown to get enough for home consumption up to 1962. Only after the independence, agricultural loans were distributed among the farmers. Agricultural loans are now being distributed by the Development Bank through the recommendation of Land Record Department, village committee and village authorities — 6000/-kyat per acre of paddy land, 8000/- kkyat per acre of farmland at the interest rate of 2 ½ kkyat per month.

In 1982, paddy was not sown in Shon Shi village due to drought spell. Dry farming also did not work out resulting in having to eat wild yam and taro for the villagers. In 2009-2010, too, they got no water from the creek due to the scarcity of rain, forcing them to conduct dry farming. But due to good rain aftermath, regular harvest was attained. Whenever there was drought, the paddy yield per acre was 20-30 baskets(1basket=46pounds), yielding only in about 20 acres of paddy land area; in remaining paddy land areas, there was no paddy at all, leaving the village without having enough rice for consumption. The villagers have to buy rice from Kalay for home consumption.

In 2010, there were 2000 acres of dry farming in Myauk Kin Yan village as the rain in the beginning of rainy season was less than ever. Glutinous rice is sown for only home consumption; only one-tenth of the total acres of paddy field are sown for growing glutinous rice by each farmer. It is also grown through dry farming, producing only 30-40 baskets (1basket=44.95pounds) per acre.

In Kyaw region, dry farming is annually conducted due to scarcity of rain, producing 30-40 baskets (1basket=46pounds) paddy per acre. In 2009, bamboos bore fruit and the fruit was eaten by mice, the effect of which preventing them from coming to paddy fields, and thus the crops were free from being damaged by the mice. The commitment of bamboos flowering and bearing fruit is locally known as “warthonthi” (ဝါးသုံးသည့်). Bamboos after bearing fruit come to an end, causing the degradation of forests though no adverse effect on farm products. In 2010, there was drought in Kyaw village area, and thus dry farming was to be practised; moreover, the invasion of rats destroying the crops occurred. The yield of paddy per acre was only 8 baskets (368pounds) of paddy in place of normal yield of 40 baskets (1840 pounds) per acre. In some fields, the yield per acre decreased up to less than one basket (46 pounds) per acre.

There were also some occasions to make nurseries again after conducting dry farming, having forecast that there would be no rain that year, but in fact rain appeared after all, resulting in the waste of paddy seeds. Nevertheless, there took place such advantages as the emergence of irrigated farm areas near Taung Kin Yan and Myauk Kin Yan villages, transformation of paddy land into irrigated farmland in the Myauk Kin Yan village, the increase in yield per acre even in the poor ‘indaing’ (အင်တိုင်း) land areas, the appearance of double cropping and triple cropping systems

not only supporting the local community with enough rice for home consumption but also selling rice to other localities.

5.4 Labour contribution

Of the five study villages, in Zahaw and Taung Kin Yan villages, tractors have been used since 1990 in place of human and animal labor. In 2010, there were 1 tractor and 1 thresher in Zahaw village; 1 tractor and 5 threshers in Taung Kin Yan village; 31 tractors and 1 thresher in Myauk Kin Yan village, boosting the use of machines.

One significant traditional custom of Yaw local people in Gangaw Township is 'arsogyin' (အားဆိုခြင်း), that is, 'labor contribution' by the neighbors whenever a family is to build a new house, to harvest crops, etc. The family usually serves the labor contributors with meals and desserts, deserving one good turn to another. This traditional practice is still being exercised in doing some activities in the area.

Transplantation of seedlings is usually conducted by females, not by males. Ploughing and harrowing are to be carried out by males. To complete land preparation work for five acres paddy field, it is needed to plough for 10 days, to harrow for 10 days and to make surface dressing of tilth for 2 days. The expenditure for cultivation: 2500/-kyat for a yoke of oxen per day for harrowing $\times 10$ days = 25,000/-kyat; 3000/-kyat for a yoke of oxen per day for ploughing $\times 10$ days = 30,000/-kyat; and 2000/-kyat for a yoke of oxen per day for surface dressing of tilth $\times 2$ days = 4000/-kyat. Therefore, the total expenditure is (59,000/-kyat) for (5) acres of paddy land, lasting a total of (22) days to complete all work process. The owner of paddy field has to serve the contributors with breakfast.

If tractor (see Figure-5.9) is used, the ploughing process lasts only one day. After filling water in the field, harrowing process lasts only another one day. Although it is known as two days' work, the work is usually completed at about 2.00 pm. without having to work for the remaining time of the day. When tractor is used, no need to make surface dressing of tilth. Thus, five acres of farmland is completed within two days.

The expenditure for land preparation: 15,000/-kyat per acre of ploughing (with tractor) ($\times 5$ acres = 75,000/-kyat); 10,000/-kyats per acre for harrowing (with tractor) ($\times 5$ acres = 50,000/-kyat); totaling (75,000 + 50,000 = 125,000/-kyat). Though it is more expensive (double charges) than ordinary land preparation, it is time-saving (for

20 days), and man and animal labor is secured, and thus other income earning activities can be done in the spare time.

Heavy tractors are not very convenient for use in the current fields. The small tractors are now in good use. These are used in the fields, substituting iron wheels in place of tyres. Transplantation work is done by females: 10 transplanters are needed to complete 10 acres of paddy land within a day. Transplantation charge for a day is 2000/-kyat per head, and thus the charge of transplantation for 10 acres of paddy field is 200,00/-kyat.

Paddy is usually harvested in November and December. It is best to harvest paddy at the beginning of ripened stage. By harvesting at that time good quality rice can be obtained. In Shon Shi village, paddy harvesting is conducted by the family members of the household themselves. In Taung Kin Yan village, asking for labor contribution (arsogyin) is common up to 1980; the paddy field owner has to offer meals with pork curry, fowl curry, etc. The paddy crop harvested thus is to be made into sheaves of paddy (see Figure-5.10) and piled into stacks including 40-50 sheaves per stack. The sheaves are to be dried in the sun for a week for easy threshing. In the task of making paddy threshing labour contribution is still common without hiring men labour. A 10' × 10' paddy threshing ground (see Figure-5.11) is needed for threshing 100 baskets (1basket =46pounds) of paddy.

First, the stubbles of paddy are to be cleared out and the ground is to be made flat using carts. Harvesting paddy, transporting sheaves (see Figure-5.12) and winnowing processes (see Figure-5.13) are still being made through participatory approach (labour contribution). The task of winnowing paddy is usually conducted by girls (see Figure-5.14) at the labour charge of 30/-kyat per basket, usually completing 50 baskets (2300 pounds) of paddy per day. Threshing paddy through cattle labour along with the labour of six men takes six days to complete 500 baskets (1basket=46 pounds) of paddy. The labour charge is 1500/-kyat per head and the land owner is to offer the labourers lunch, totaling 45,000/-kyat.

Threshing paddy through machine (see Figure-5.15) along with the labour of 10 men takes one day to complete 500 baskets (1basket=46 pounds) of paddy. The labour charge is 1500/-kyat per head and the land owners is to offer the labourers lunch; the charge for hiring the machine is 100/-kyat per basket (46 pounds) of paddy.



Figure- (5.9): Ploughing with tractor



Figure- (5.10): Sheaves of paddy



Figure- (5.11): Making paddy threshing ground



Figure- (5.12): Transporting sheaves



Figure- (5.13): Winnowing paddy conducted by men



Figure- (5.14): Winnowing paddy conducted by girls

Therefore, the total charge of threshing paddy for 500 baskets (23000 pounds) is 65,000/- kyat. Should the machine be used for threshing, labourers are not generally hired; instead, labour contribution (see Figure-5.16) in turn is practised. Without hiring ten men, the total expenditure is only 50,000/-kyat saving a lot for farmers. When Shwetoe (ရွှေတို့) paddy variety is threshed, using machine (thresher) is more convenient as this paddy variety usually lasts 8 days to complete the threshing process, lasting more than two days than other paddy varieties, through using cattle labour. As a result, utilization of machines in place of cattle becomes popular among farmers.



Figure- (5.15): Threshing paddy through machine Figure- (5.16): Labour contribution: threshing paddy through machine

5.5 Crop production

Most people in Gangaw Township live on agro-based economy. Paddy cultivation, horticulture, livestock breeding, growing vegetables and crops on sandbanks are their main agricultural and livestock activities. Catching fish for villages near rivers and creeks, hunting in Chin villages are often quite common.

The Bamar (Yaw) in Gangaw Township conserve their various resources. They enlarge crop plantations and crop varieties. Due to the increase of migrants into the area, more agricultural products are produced for enough consumption in the locality. Appropriate varieties of fruit tree and plants in accordance with the soil type have to be grown in paddy fields, farmlands and sandbanks for their living.

5.5.1 Crops grown on paddy fields

Sesame is generally sown on paddy fields before paddy is sown. Short term sesame is usually grown with 8 baskets (1basket=54 pounds) of yield per acre. As soon as sesame is harvested, paddy is grown right away. After paddy is harvested, green pea and wheat are generally sown. After 1962, Gangaw was recognized as the wheat special area, and model wheat fields and irrigated wheat fields were grown. Once, the local people had to eat corn-rice because the region had been growing common millet, Italian millet, and corn (Tin, Myint, 1992). Wheat growing, after the harvest of paddy, has now been conducted to some extent in Kyaw village. Wheat growing has decreased a lot now as it needed to pump water by water pumps, and also as its yield per acre has decreased. Sunflower, peanut are now grown. After these crops are harvested, the cycle of growing paddy comes again. Therefore, there are triple crops as well as double crops in paddy fields. In Shon Shi village, there are altogether 30 acres of triple cropping area, 60 acres of double cropping area and 400 acres of one crop area.

Sesame is generally grown in paddy fields before growing paddy. It is also common growing sesame (see Figure-5.17) in fertile farmland and sandbank areas. It is best to grow sesame during May – June (in Tagu and Kason months). There will be no fruit if it is late in growing although the plant might be strong. There is no need to plough; only harrowing from 10 to 18 layers of tracks is needed. Two small baskets (pyis) (6.8pounds) of sesame seeds per acre are needed to be broadcast with one layer of tracks after broadcasting seeds. When sesame plants have grown up, thinning process needs to be conducted. The plants pulled up due to the thinning process become manure for the remaining plants. At the age of 15–20 days, the sesame plants are to be thinned by using the harrow.

The sesame plants go rotten when exposed to extreme weather; the disease is known as fungus. If fungus is contracted, the yield per acre decreases up to 5 baskets (270 pounds) of sesame whereas the normal yield is 10 baskets (540pounds) per acre. Not only the yield decreases but also its taste is bitter. Fungus always emerges every year, so the average yield per year is 7 baskets (378 pounds) per acre. In 2000, the Agriculture Department gave awareness on fungus infection through spraying fungicide. This can prevent the roots from rotting. After three months, the sesame can be harvested. They are piled, pods face to face, for a week, covering with banana

leaves or reeds. Then those must be placed upright in the sun for a week again before shaking (threshing) them into the bamboo baskets in a single day. And then the seeds are to be separated through a bamboo sieve. Sesame does not need a lot of rain: good rain at the beginning or end of the rainy season causes sesame bad effects. Corn, roselle, lady's finger are grown mixed with the sesame, but cucumber is not, as it damages sesame.

Moreover, sunflower is grown not only on paddy land but also in farm land areas after the harvest of paddy while the moisture is still in. Rainy sunflower is usually grown in May and harvested in August. For winter sunflower, it is generally grown in November and October and harvested in January and February. The government gave guidance to grow sunflower as the multiple crop in 1985–86. The slogan 'Sow sunflower as a multiple crop with whatever crop you grow!' (see Figure-5.18) appears beside the village streets. The farmers initially refused to grow sunflower. But they later came to know its strengths: it does not need to be weeded; it needs only a little investment, etc. Sunflower was grown a great deal in 1991–92 as a multiple crop. Some farmers even grow sunflower separately as they came to know its good yield and simple growing technique. In Shon Shi village, sunflower growing (see Figure-5.19) took the place of sesame and groundnut growing.

The sunflower seeds that are to be sown need to be covered with straw for a night to retain warmth. If there is no warmth at all, it needs to be sprayed with warm water. Then it is ready to be broadcast. Later, the farmers came to know to grow sunflower as a multiple crop (see Figure-5.20) along with butter bean, peanut and green gram. Some grow (broadcast) sunflower as soon as paddy is harvested. It can, thus, be easily harvested without doing anything.

As per the 49 year old villager who lives in Zahaw village, sunflower is grown as a multiple crop with butter bean. It does not interfere with other crops, only bearing fruit above, and three months later, it can be harvested. Butter bean takes five months to be harvested and thus it can grow freely within one and a half month. By managing like this, no space of the soil is wasted, obtaining fruits from butter bean and sunflower at the same time in the same place. At present, no worry for farmers even though there is flood due to heavy rain, causing damages to sesame field because sunflower will work out, instead. In 1995, green pea was sown in Taung Kin Yan village, but it did not weather and was prone to disease. So sunflower is sown at present in place of green pea. By growing sunflower, man and animal labour is saved,

as there is no need to go into the sunshine for threshing, less loan expenditure for sunflower growing, and obtaining similar amount of income. In 2009–2010, parrots in groups damaged the sunflower fields, causing a great decrease in sunflower growing in these study areas.



Figure- (5.17): Growing sesame



Figure- (5.18) The slogan “Sow sunflower as a multiple crop with whatever crop you grow!”



Figure- (5.19): Growing sunflowers



Figure- (5.20): Sunflower as multiple crop

5.5.2 Crops grown on farmland

Butter bean and groundnut are mostly grown on the quality farmland areas. Mung bean, green gram and sesame are grown on the remaining farmland areas. Corn is grown as a multiple crop. Up to 1962–1988, butter bean was greatly grown as per the planned buying system by the state. Butter bean is the best trade mark product in the area not only selling it to Monywa, Pakokku but also exporting to Japan. Gangaw region produced thousands of baskets (1basket=69 pounds) of butter bean.

After the harvest of sesame on farmland, butter bean is generally sown. In 1981–82, Gangaw was recognized as the special township zone for butter bean production, including 19 village tracts. The front education camp took place at Taung Kin Yan village, providing farmers with awareness training courses, including fortnight short training courses starting from the time of seed selection up to the harvest time. There are two types of butter bean: Gangaw butter bean and Mahlaing (မေ့ရှင်) butter bean. Gangaw butter bean is more expensive and heavier in weight. In 1984–85 “The best and most productive township in butter bean production” award was given by Food and Agriculture Organization (FAO) (Tin, Myint, 1992). The Ministry of Trade and Agriculture bought butter bean through buying centers. After 1988 the acre sown decreased and the Ministry bought it no more. In 1995–96, butter bean growing was substituted by sunflower and groundnut growing.

Butter bean is grown in October and November; two layers of tracks for ploughing, and four layers of tracks for harrowing are needed and taking 10 days per acre by a yoke of oxen. Five days later, the plants grow; and 20 days later, it needs to be thinned with a plough. Four or five days later, flowering begins; and then it can be harvested about four months later. The husks and leaves of butter bean and mung bean are called “pethwin” (ပဲသွင်း). The leaves and stems of butter bean is also used for cattle feed processing them by treading and cutting into pieces. The feed is liked by the cattle very much, and they get nutrients from them. The remains, after butter bean and green gram are threshed and after the stems are separated. These are also used as natural fertilizer.

By eating beans and peas, protein and nutrients are retained for human beings. The husks, stems and leaves of peas and beans also give nutrients to animals. Human beings are always trying to fulfill the needs of the cattle to be able to live and grow well, as they are benefactors providing them with necessary labour. Cattle dung, being

disposed of after eating the husks, stems and leaves of peas and beans, is a very valuable natural fertilizer for crops.

Rainy season groundnut is also grown in farmland areas. At present, in place of butter bean, kidney bean and corn, peanut is grown in winter. Rainy season groundnut begins to grow in June and is harvested in October. Winter groundnut begins to grow in August and September and is harvested in December. After the harvest of sesame in farmland, weeds are cleared, taking one day per acre being harrowed by two yokes of oxen making at least two to five layers of tracks. Then the weeds are gathered and burnt completely as remains of old weeds cause fungus that damage and affect the crop.

If it rains after ploughing, it needs to plough again as the soil is compacted by the rain. In some years of heavy rain fall, ploughing has to be done 3–4 times. If it rains during the flowering time, more fruit bears. If there is no rain, no fruit bears at all. Groundnut seeds (see Figure-5.21) that are to be sown need to be heated appropriately and to have sprouts in winter. Before the age of one month, thinning process needs to be conducted, the process known as ‘htethihmone’ (ထသီးမှန်). Along with aerating, weeds must be picked up if there are any. Weeding must be done fortnightly or monthly. After three and a half months later, it is the best time to be harvested (see Figure-5.22).

There are four kinds of groundnut: Tontarni (တွန်တာနီ), Spate (စပိတ်), Stoke (စတုတ်) and Theikpan (သိပ္ပံ). The pods of Tontarni have three joints with red seeds. It was grown in 1988, but now grown only a little for family consumption. Spate variety was grown before 1988, but not grown now due to less yield except for family consumption. The pods of Stoke variety have two joints. The yield of its variety and the rate of its oil production are good and thus it has become a specially grown variety.

Theikpan variety produces a lot of pods, but its seeds are thin. Stoke and Theikpan varieties are produced and distributed by the Agriculture Department after 1990. Sandbank groundnut growing was started around 1994–95. In the groundnut field, water melon (see Figure-5.23) is grown as the multiple crop. Corn is also sown as the multiple crop for cattle feed (see Figure-5.24). It can be cut and used as cattle feed one and a half months later. Sunflower is grown around the groundnut fields not as multiple crops, so as not to give shade to groundnut plants and affect its yield. The

other crops sown in farmland area are corn, green pea, mung bean, mung (black gram), green gram, pigeon pea, rice bean. Other consumer crops such as chilli, Indian mustard, cauliflower, potato, onion and roselle are also sown.



Figure- (5.21): Groundnut seeds



Figure- (5.22): Harvesting the groundnut plants



Figure (5.23): The groundnut grown with water melon



Figure (5.24): The groundnut grown with corn

5.5.3 Crops grown on sandbank

Vegetables and crops such as sesame, butter bean, groundnut, sunflower, cucumber, chilli, khawe (ridged gourd), etc., are sown on sandbanks (see Figure-5.25). Water melon is mostly grown in sandbank areas. In 1990, they started growing Taiwan species (from Mandalay) in Zahaw village. After 1995, it increased up to commercial level.

Table-12.Preparation for growing crops according to season

Crop grown		Crop planting time	Harvest time	Remarks
Paddy (rainy season)		July, August	November, December	
Paddy (summer)		February, March	June	
Sesame		May, June	August	corn, roselle, lady's finger (multiplied)
Sunflower	Rainy Season	May, June	July, August	All crops except groundnut (multiplied)
	Winter	October, November	January, February	All crops except groundnut (multiplied)
Butter bean		October, November	February, March	Sunflower (multiplied)
Groundnut	Rainy Season	June	October	corn, water melon, except sunflower (multiplied)
	Winter	August, September	December	corn, water melon, except sunflower (multiplied)
Panhnan				
Pigeon pea		July, August	April, May	Sesame (multiplied)
Rice bean		July, August	November, December	mung bean (multiplied)
Mung bean		July, August	October, November	Rice bean (multiplied)
Water melon		September	February	Groundnut (multiplied)

Source: Gangaw District Gazetteer, 2007

Water melon flourishes along the riverbanks of the Myitthar River and its confluences with Zahaw creek as the soil in those places is very fertile, making the Zahaw water melon (see Figure-5.26) famous for its sweetness and deliciousness. The water melon seedlings are nursed separately for a month. The seedlings are sown five rows (of groundnut) apart. Groundnut is harvested after 3 ½ months, and the water melon (see Figure-5.27) continues to grow on that land space. After five months, the water melon is harvested. It is best to grow groundnut and water melon multiplied because, after the harvest of groundnut, more space is available for water melon to grow and bear fruit better. It was grown in Taung Kin Yan and Myauk Kin Yan villages in 2007. In

2009, there were 5 acres of sown area (multiple crop) and 30 acres of sown area (separately sown) of watermelon in Zahaw village.

Farmers grow tomato, roselle, bonlon (*Tricosanthes cucumerina*), chilli, supokekyi (*Acacia intsia*), supokethe (ဆူးပုတ်သေး), and corn for the consumption of both men and animals when they are on farms harvesting crops. Moreover, they also sow Indian trumpet, bitter gourd, mushroom, bamboo shoot, water cress, palaungywet (ပလောင်းရွက်), etc. Indian mustard, (see Figure-5.28) cauliflower, roselle, etc. are also sown nearby. Various plants that naturally grow nearby also give them nutrients. Myu (goose foot) leaves, hinchetpadaung (ဟင်းချက်ပတောင်း), hinnunwe (amaranth) (ဟင်းနုနွယ်) and supauk (ဆူးပေါက်) tender leaves are consumed as food. Toddy trees and thitseik (*belleric myrobalan*) are also grown around the farms.



Figure (5.25): Crops grown on Sandbank



Figure (5.26): The Zahaw water melon



Figure (5.27) Watermelon harvested: five rolls of groundnut apart



Figure (5.28) The India mustard

5.5.4 Crops grown on indaing (virgin land)

Panhnan (*Guizotia abyssinica*), pigeon pea, rice bean, green gram are grown in ‘indaing’ (အင်တိုင်း) (Virgin) land areas (see Figure-5.29). It is sown not only for human consumption but also for animal feed. Panhnan (*Guizotia abyssinica*) is grown in land areas where no other crops are favourable. Harrowing at least 2–3 layers of tracks, feeding no fertilizers, and weeding is not necessary as there are no weeds. Rain in the flowering time may cause no fruit. If there is no rain, the fruition is successful. The sunflower oil and panhnan oil are good for high blood pressure treatment.

Pigeon pea started growing in 1990. It is sown in July and August along with sesame as a multiple crop, being broadcast in the space where sesame is hard to grow. After 3 ½ months later, sesame is harvested, leaving pigeon pea for 9 months to be harvested; thus, double cropping is practised without wasting the land area. Pigeon pea is also sown on stone slopes (Kyaukkhezaung–ကျောက်ခဲစောင်း) land areas where winter crops are unfavorable without doing weeding process.

Migrants, who live in Shon Shi village, coming from Chin Hills, generally grow sesame in the rainy season, and after the harvest of sesame, pigeon pea is sown. In Shon Shi village, there are more than 200 Chin nationals who are landless. They go back to the farms that are 6–7 miles far away from the village, and work there. They came home on Saturday, and on Sunday go back to the farms again. They use ‘palaing’ (bamboo basket with straps) to carry crops.

Rice bean are sown in July and August, requiring to harrow 5–6 layers of tacks; there is no need to weed and water. More snow, more fruit, and less snow, less fruit. Rice bean takes (4) months to be harvested, and green gram (3) months. Rice bean is sown in Myauk Kin Yan village in poor soil areas for cattle feed (see Figure-5.30). Cattle are pastured in the fields when farmers go to their farms night long. In

Shon Shi and Taung Kin Yan villages, there is a scarcity of pasture land. The sown area acre is limited due to the necessity to spare for pasture. As per the 62 year old Taung Kin Yan villager, triple cropping takes a lot of nutrient from the soil, leaving the soil exhausted, resulting in poor yield. After the completion of the dam, 100 baskets of paddy yield per acre is obtainable even in the poor farmland “indaingtaw” (အင်တိုင်းတာ).



Figure (5.29) Panhnan and pigeon pea in indaing (virgin) land area **Figure (5.30) Rice bean for cattle feed**

5.5.5 Horticulture

Horticulture is generally practised in homestead area and home compounds. Roselle, tomato, string bean, and kidney bean are generally sown. If water is available, cauliflower, cabbage, Indian custard, (see Figure-5.31) onion and garlic are sown in (two-three) rows (ridges). Indian custard was grown in 2007–2008. Banana (Phegyan-ဖီးကြမ်း and thihmway-သီးမွေး) are grown around home compound, which need no water. In Zahaw village, horticulture was practised commercially in 2008. As per the 42 year old Zahaw villager, he started growing horticulture in 2008 on three acres of land, growing guava, mango, plum, cucumber (scented), thitsarpan (gladiolus), and tomato.

In Myauk Kin Yan village, plum and mango are sown. Aster, rose, holland flower, and thitsapan (gladiolus) are also sown. In 2009, gandamar (chrysanthemum) was also sown commercially. As per the 30 year old Myauk Kin Yan villager, he has grown water melon and tomato on 0.5 acre piece of land (tomato is sown under the supervision of Aubar manager). Watering with canal system and giving nutrients are conducted as per the Inlay method (see Figure-5.32). The tomato is transported to Kalay by train. The buying centers from Kalay sometimes buy tomatoes directly. These are the advantages of railway transportation, for example, tomato that had to be bought from other localities, is now being transported to other regions for sale.



Figure (5.31): Cabbage and India mustard at home compound



Figure (5.32): Tomato sown by Inlay method

5.6 Labour supply

In the five study villages, small rice mills and oil mills have been running since 1970; at least one each to utmost three each in each village. After the completion of the Taung Kin Yan Dam, a number of agriculture crops, even new varieties of crops, have been grown in Taung Kin Yan and Myauk Kin Yan villages with their yields in a higher state. In 1970, there were three rice mills and two oil mills in Taung Kin Yan village, and two rice mills and two oil mills in Myauk Kin Yan village. In 2010, there are five rice mills and five oil mills in Taung Kin Yan village, and fifteen rice mills and four oil mills in Myauk Kin Yan village (see Figure-5.33). Each rice mill can mill more than 10,000 baskets (1basket=46pounds) of paddy per year; each oil mill can produce 100 baskets (4600 pounds) of oil crops per day.

Moreover, when sesame is harvested, even one or two days late harvesting is not permissible. Therefore, the labourers from Chin hill must be hired 10-15 labourers per family, at 2000 kyat per head, being served with meals at the same time. In Myauk Kin Yan village, growing and harvesting charges are often paid on piece-work per acre. The charge is 45,000-50,000 kyat per acre for sesame growing, and 30,000 kyat per acre for sesame harvesting, requiring extra payments on emergency cases.

When beans are harvested, it is 40,000 kyat per acre for two men and two carts. Through using tractors, only one day is needed to complete 10 acres along with the labour of 20 men, at 2000 kyat per head \times 20 men = 40,000 kyat, plus one gallon of

diesel oil for the tractor per day. Using machines costs less expenditure, and completes work ten times faster than using man power, enabling quick harvest in case of bad weather. Therefore, farm products are capable of escaping from loss affected by bad weather through using machine. In Myauk Kin Yan village, 30% of the whole work volume is done by using machines.



Figure (5.33) Oil mill in Myauk Kin Yan Village

5.7 Utilization of fertilizers and chemicals

The principal livelihood of the five study villages is agriculture. Accordingly, inventions for boosting the productions of farm crops are quite common. Most human refuse and farm products are usually recycled as fertilizer, recycling being used in such respects as the maintenance, development and quality control (Sutton, Mark Q and Anderson, E N, 2010). In the region, the resources are animal dung, farm wastes such as butter bean husks (pethwin) (ပဲသွင်း) and chaff, stubbles, ashes retained from daily cooking, etc.

Utilization of natural fertilizers

In the five study villages, natural fertilizers have been used since previous times. Cow dung, buffalo dung, manure of bat, chicken, pig, etc., are stored for the whole year for use as fertilizer (see Figure-5.34). Moreover, the husks and chaff (pethwin) (ပဲသွင်း),

farm products such as butter bean, green gram, black gram, etc., are also used as natural fertilizers (see Figure-5.35). Unlike other regions, crops are harvested leaving about one foot of stubbles so that they will decay and act as nutrients for future crops. Decayed tamarind leaves and stove ashes are also used as natural fertilizer. Bat refuse is obtained from “Pyarnattaung” (ပျားနတ်တောင်) and Chin hills. Now, bat refuse selling has decreased with the scarcity of real bat refuse.



Figure (5.34) Cow dung and buffalo dung used as fertilizer



Figure (5.35) Pethwin used as natural fertilizer

According to the 34 year old Zahaw villager, chicken refuse is used for the increased production of farm crops. Chicken refuse is better than cow dung. In 2009, 8 carts of

chicken refuse were inserted, but due to lack of rain, the crops were burnt and yielding only 50 baskets (2300 pounds) of paddy per acre were counted. In 2010, 8 carts of chicken refuse were used, and due to good rain fall, 150 baskets (1basket=46 pounds) of paddy per acre were produced.

Utilization of chemical fertilizers

In Shon Shi, Zahaw, Taung Kin Yan and Myauk Kin Yan villagers, the awareness campaign on the use of chemical fertilizer was conducted in 1981-82. In 1984–85, use of chemical fertilizer was begun. They started using a great deal of chemical fertilizer in Zahaw village in 2003, in Kyaw village in 2007. In Kyaw region, only a minority of villagers uses chemical fertilizer; they are still using the natural fertilizer. And in Taung Kin Yan and Myauk Kin Yan villages Pale fertilize was used in 2008–09.

Using excessive chemical fertilizers for 2-3 years had used up calcium in the soil and caused acidity, resulting in a decrease in yield per acre. In this case, the field is left the whole year round without sowing any crop. Moreover, after inserting cow dung, ashes, and salt into the field, it was ploughed and left for a year round. The next year, the soil retains its normal soil content again.

As per a 62 year old Taung Kin Yan villager, the price of chemical fertilizer is expensive, more than 20,000 kyat per bag, so it is unaffordable. The price of ‘Pale’ fertilizer was only 9-10 kyat in the time of Burmese Socialist Policy Party, which is not too expensive. They need to use ‘Pale’ fertilizer only three times: first in the nursery time, second in the growing time, and third in the budding time (ဖုန်းအားလုံးအားအချိန်). So it is beyond everybody’s reach. So rice husk is burnt and used as natural fertilizer. Cow dung, too, has to be bought as they do not keep cows. That year, cow dung was hard to buy. Burnt rice husk, a little ‘Pale’ and two carts’ load of cow dung are generally used as fertilizer every year.

Utilization of (chemical) pesticides

In former days, pest prevalence is rare – only once 2-5 years. At the beginning of the rainy season, spreading lime and ashes is usually conducted. In Shon Shi village, using pesticides started in 1970-71 and it was in 1984-85 when most pesticides were used. In 1984-85 pesticides were also used in Taung Kin Yan and Myauk Kin Yan villages in.

In Kyaw village, the practice of using pesticides is still hardly seen as there are less farmers and they use less fertilizer. Spraying pesticides is usually done in years when rain is scarce. In 2008–09, there was the drought and a great deal of pests prevailed in sesame and paddy fields, forcing farmers to use pesticides.

As per a 49 year old Zahaw villager, three buffaloes died having eaten the crops freshly sprayed with pesticides. Some people suffered from diarrhea and vomiting after eating the freshly sprayed crops. Insecticides can kill not only insects and pests but also birds such as sparrows and mynas that eat earthworm, fish and insects that create fertilizer. Moreover, leeches, frogs and molluse may also be killed. If it rains after spraying pesticides causes less death. By using pesticides every year thus, the natural fertilizer creators (birds and insects) may be in danger of extinction in years to come. They may lead to less yield of crops as the natural process to create natural fertilizer decreased, and thus endangering the existence of human beings. Bean fields have less prevalence of pests, and so the use of ashes and lime has still been prevailed. Use of herbicides started in 2009–10, especially used in the sesame and groundnut fields; but not used in the paddy fields as it may cause the death of paddy sprouts. Groundnut and sesame need to be weeded 20 days later. The charge of weeding is 1000 kyat per head a day, requires two days labour by 6 men per acre, totaling 12,000 kyat per acre for weeding charge. The price of a bottle of herbicide is 3,500 kyat requiring a bottle per acre. It is mostly used as it reduces the expenditure a lot. The use of plant tonic and leaves spray tonic was started in 2007-08 in Taung Kin Yan and Myauk Kin Yan villages. In Kyaw village, the farmers have not used herbicides, plant tonic, and leaves spray tonic as yet.

5.8 Animal husbandry

Most farmers keep certain animals at home for home consumption, especially such small animals as pigs, chickens and ducks. Cattle are generally bred in order to use their labour in farming, along with other intentions such as to get meat (for consumption), hides and milk and to use their refuse and wastes as natural fertilizer.

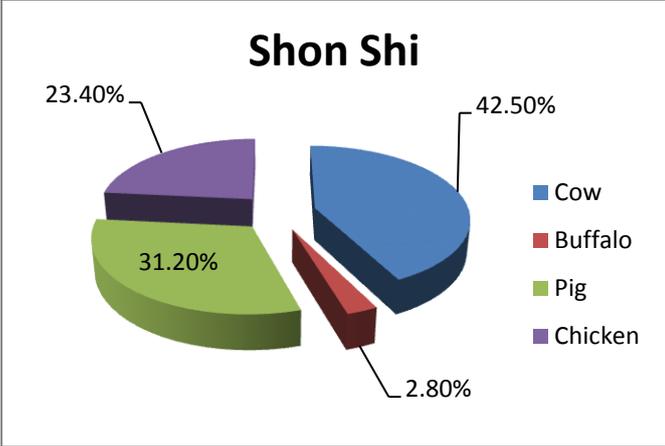


Figure-5.36: Animals kept in Shon Shi Village in 2010

Source: Village Peace and Development Council, Shon Shi in 2010-11

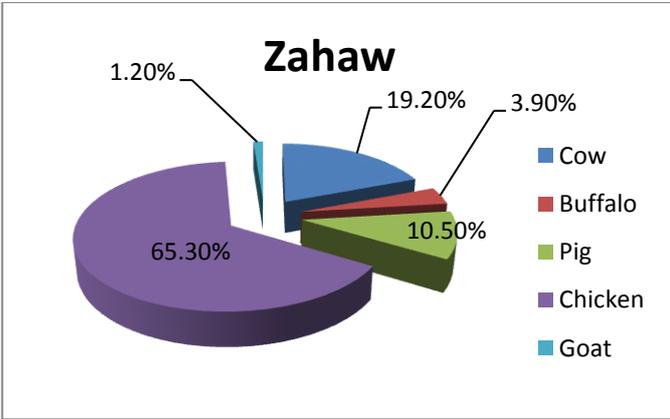


Figure-5.37: Animals kept in Zahaw Village in 2010

Source: Village Peace and Development Council, Zahaw in 2010-11

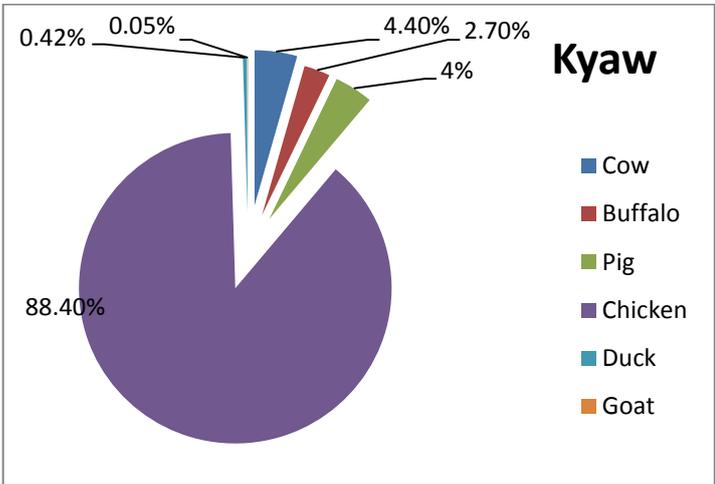


Figure-5.38: Animals kept in Kyaw Village in 2010

Source: Village Peace and Development Council, Kyaw in 2010-11

Fowl (chicken) breeding

Nearly every house, in the five study villages, practise poultry breeding. By breeding a hen for family consumption, the leftovers of food are not wasted any more. About 20 chickens per house are usually bred, feeding the chickens with vegetables, hyacinth, lotus stalks, knotgrass, etc: all of which are naturally grown without costing any extra expenditure for chicken feed. In Shon Shi village, a total of 23.40% for chicken were raised in 2010 (see Figure- 5.36). In Zahaw village, a total of 65.30% for chicken and In Kyaw village, a total of 88.40% for chicken in 2010 (see Figure- 5.37, 38). In Taung Kin Yan village, a total of 63.70% for chickens were raised in 1990 and in 2010, a total of chickens raised increased up to a total of 68.40% (see Figure-5.40). Similarly, in Myauk Kin Yan village, 79.60% for chickens were raised in 1990, and in 2010, a total of chickens raised increased up to 89% (see Figure-5.45). Raising chickens (see Figure-5.39) commercially started in 2006 in Zahaw village. The eggs are sold at the Gangaw market. The chickens also eat worms in and around the homestead compound. They are given corn or broken rice twice a day. No separate shelter for chickens is needed. They usually sleep on the cross-beams of the house. Chickens are mainly bred for family consumption; the surplus being sold. As every house keeps chickens, the villagers no longer need to buy eggs; only migrants buy the eggs.

The poultry farm is to be cleaned fortnightly through changing the paddy husks, spreading lime powder, and spraying the mosquito repellents, etc. In addition, by keeping and storing chicken refuse systematically, it can be used as a very valuable fertilizer in growing crops. Chickens often eat pests, and thus can control the prevalence of pests.

In olden days, they had the practice of offering the Nat (spirit) with chicken. This is called 'Hnotethisone khaukchin'(နှုတ်သီးစုန်းခေါက်ခြင်း) so that the bride and bridegroom might live without harm. It has still been practised in some regions. Therefore, chickens are taking part not only in nutrient issues but also in social, economic and religious sectors. As chickens are regarded as an essential thing for the smooth running of their lives, they are raised most among the breeding animals by the local people.



Figure (5.39): Raising chickens in Zahaw Village

Cattle breeding

In Shon Shi village, a total of 42.50% for cows and 2.80% for buffalos were raised in 2010. Similarly, in Zahaw village, a total of 19.20% for cows and 3.90% for buffalos were raised and in Kyaw village, a total of 4.40% for cows and 2.70% for buffalos were raised in 2010 (see Figure: 5.36, 37, and 38). Cows are raised more than buffaloes. Oxen can work harder than buffaloes: oxen can work three hours whereas buffaloes can work only two hours. As buffaloes nearly always need to soak in water, as they feel easily tired in hot weather, and as they have to be pastured where water is available, breeding buffaloes has decreased. After the completion of the Taung Kin Yan dam, people happen to breed more cattle in addition to expansion of farmland areas and growing more crops. In Taung Kin Yan village, a total of 5% for buffaloes were raised in 1990, and in 2010 a total of breeding buffaloes decreased in 2.20% (see Figure-5.40). Moreover, the total of buffaloes kept in Myauk Kin Yan village has decreased from 2% in 1990 to 0.70% in 2010 (see Figure-5.45).

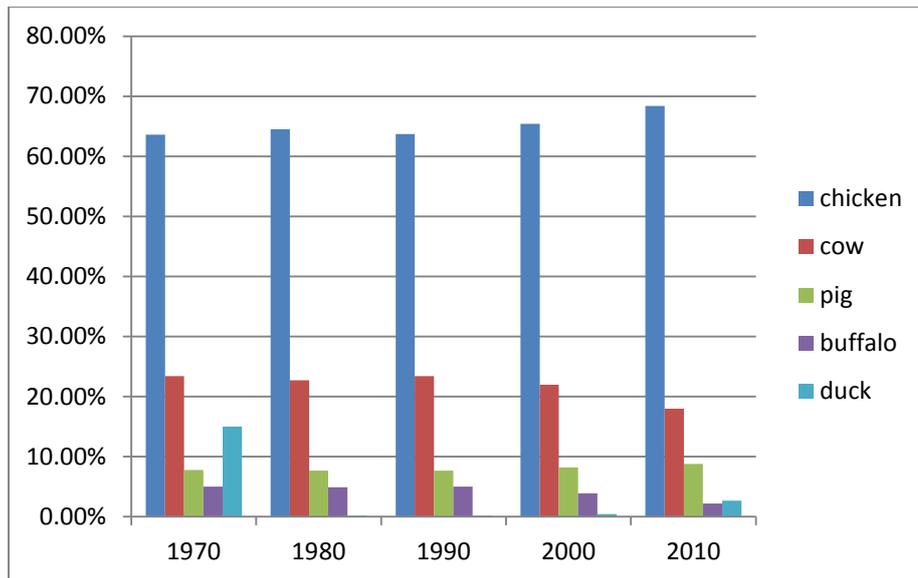


Figure-5.40: The status of animal breeding in Taung Kin Yan Village

Source: Field survey in 2010-11

Corn, straw, butter bean stalks and husks (pethwin) (ပဲသွင်း) are separately grown and stored for cows to feed for the whole year round. Regarding "pethwin" as nutrient for cows, those are cut into pieces, mixed with straw and given to cows as tonic feed (see Figure-5.41). Buffaloes are pastured in pastures, (see Figure-5.42) and scarcely fed at home.

The practice of hiring cattle is common. Cattle are used for farming and drawing carts to transport firewood and bamboo. Buffaloes are used to haul logs, timber and bamboo without the cart (see Figure-5.43). As per a 65 year old Taung Kin Yan villager, Chin nationals who are migrants from the Chin Hills generally hire cattle: the charge for a yoke of buffaloes or oxen is 60 baskets(1basket=46 pounds) of paddy per year. The person who hires the cattle has to feed them. Hiring cattle used to be done at paddy harvest time, and after the completion of work, both the cattle hired and the paddy agreed must be given to the owner.

Cattle hides are used as mats. Previously cattle hides are used as mats while carrying paddy. Cattle hides are still being used as mats (see Figure-5.44) in carrying sand and gravel. In carrying gravel, cow hides and buffalo hides were bought by traders from Kalay, but now cow hides and 'barking deer' hides come from the Chin hills and sold in the region. There is no cow killing stage (ground). When the cattle grow old and die, they are buried without being eaten. 70% of the total labour utilization in the agriculture sector is cattle labour, which is still being used today. It is therefore true

that killing the cattle daily for consumption may greatly affect the agricultural cultivation. Cattle are therefore exempt from being killed and eaten, considering in the long run their existence and sustainability may help improve the living standard of the society.



Figure (5.41): Cows eating pethwin as tonic feed



Figure (5.42): Buffaloes pastured in pastures



Figure (5.43): Buffaloes pulling bamboos



Figure (5.44): Cattle hides used as mats

Entrusting the animals (apwarpaychin) (အပ္ပာလးငြိး)

In entrusting a cow, the first born calf must go to the breeder, the second born calf to the owner (who entrusted the cow). Moreover, there is another entrusting practice namely 'kyetoe'(ကြေးတိုး), for example, if an ox was entrusted at the value of 200,000 kyat last year, and it has been sold at the price of 300,000 kyat this year, 200,000 kyat

will go to the owner of the ox, and the remaining 100,000 kyat will be shared alike between both sides. In entrusting a pig too, it is to share the value of the born piglets alike. It is an arrangement to cover the expenditure of the families in some way.

Raising pigs

In the five study villages, 90% of the households raise pigs and fowls. Pigs are generally raised for the production of meat. They generally buy piglets (wetlupauk) (ဝက်လူးပေါက်) (1½ – 2 months old) that are already castrated, costing 35,000 kyat-40,000 kyat per head. Those are resold after a year (at the average weight of 100 visses) (163.4 kilogram) at the price of 300,000 kyat per head. At least 2-5 pigs are raised per house. The pigs are fed with only the remnants of food left after being eaten by the family and the weeds such as water hyacinth that are naturally grown. Moreover, sesame oil-cake, rice bean and butter bean are also fed. Pigs are fed five times a day while they are young, and 3 times a day when they grow up. Pigs are spared to get emergency cash for health and social activities, and to use as the bride price (ဖလားကြေး). Previously when making a devotional offering made by a Nat-sayar (ပုဇွန်ဆရာ) in order to be healthy and wealthy for the whole village, pigs were also killed and offered to spirits. Pigs thus take part in the essential role for the living convenience of the community.

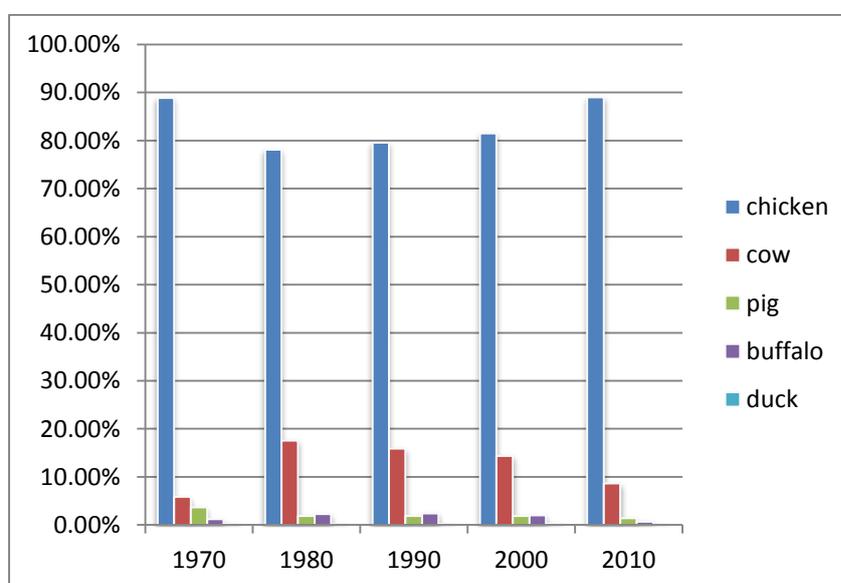


Figure-5.45: The status of animal breeding in Myauk Kin Yan Village
Source : Field survey in 2010-11

Raising other animals

They started to raise goat in this area in 2008. Being the water-scarce area, ducks are raised only a little. In Taung Kin Yan village, 0.15% for ducks were raised in 1970, 0.47% for ducks in 2000, 2.70% for ducks in 2010 respectively (see Figure-5.40). In Myauk Kin Yan village, 0.20% for ducks were raised in 1980 and in 2010, a total of ducks raised increased up to 0.30% (see Figure-5.45). The increases in raising ducks are due to the availability of water after the completion of the Taung Kin Yan dam. Geese are raised since the former times for the security of houses as they honk noises when the intruders come.

Horses are raised to ride on horseback when the people go to the fields and to be hired for ceremonial occasion of novice-to-be. After the completion of the railroad, horse-carts are running from the railway station as the passenger vehicles. Cats and dogs are not eaten, and dogs are used in hunting. They do not need to be ordered to go into the forest; as soon as their masters start to go for hunting, they accompany their masters right away. In the forest, they know the dangers in advance, for example, the danger of king cobra.

5.9 Hunting and fishing

In the five study villages, hunting is seldom practised. Hunting is done by Chin nationals who came from the Chin Hills to Pontaung Ponnya. Formerly they trapped rabbit, barking deer, wild boar, monitor lizard, padat, and baby tigers in order to eat meat. They use spears when they go hunting with dogs. Barking dears and wild boars damage the crops and so farmers need to watch out at night. At present, they dig the eggs of monitor lizard in the rainy season. When they are on the farm to harvest crops, they dig and find frogs and catch frogs at leisure to get meat for food.

They fish in the Zahaw creek, the Myitthar River and the Palaw (ပဲခူး) creeks. Fish is also caught in the Taung Kin Yan dam and hand –dug dams. Formerly they caught fish using fishing lines, fishing rods and fish hooks. Right now they use a battery to shock the fish. Fingerlings and prawns are generally caught in the area. Big fish are sold here by fishermen from Monywa (see Figure-5.46). Fishing is conducted only in the rainy season and winter, and not in the summer due to scarcity of water.



Figure (5.46): Big fish sold from Monywa

5.10 The social environment and food getting strategies in trade

The trading systems being practised in the five villages of the selected area are local trading and trading with other localities in the country. The main trading business is running home shops, selling commodity goods, farm products, forest products, and accessories for handicraft, oil extraction, and construction. In producing crops, some crops are locally self-sufficient, some are in excess, but some are in shortage. To solve this problem, trading goods is the best solution — its commitment can not only wipe out food shortages but also support the main village businesses such as weaving, sewing, timber production and oil extraction with necessary accessories.

Of the villages in the study area, most trading businesses lie in ‘Kyaw’ village. Geographically, ‘Kyaw’ village stands on both sides of the main road; moreover, railway is accessible to the village. The main road stretches to Gangaw and Chin hill, being accessible to Pakokku, Mandalay and Monywa, the large cities of Dry Zone, enabling the village to carry out different kinds of business dealings. The communication accessibility to Kyaw village causes to induce business dealings with other localities. It thus geographically becomes a main local trading area. It also becomes the refuge of merchants, railway workers, and oil filed labourers who come from other areas.

Trading farm products

The Virginia known as the Palaw Virginia (ပလော့ဆေး), previously grown near the Palaw creek, is sweet in taste. The Virginia produced in Zahaw village is hot in taste. The Virginia leaves and stuff are sent to and sold at Pakokku, Htilin and Pauk townships by boats in rainy season and by bullock-carts in summer. The butter bean, one of the planning crops of Pakokku in 1962, is produced in Gangaw Township and exported to Japan via Monywa and Mandalay. Shon Shi village that has still been in shortage of rice buys rice from Monywa, Pakokku and Kalay townships. Up to 1980, Shon Shi villagers had to consume the combination food of rice and corn due to the shortage of locally produced rice.

In round about 2000, groundnut was introduced in place of Virginia and thus it has become a hot item of crop producing and selling the most. The small brokers earn 100% brokerage per basket (25 pounds) of groundnut, selling it to Gangaw brokers. By selling groundnut, the farmers can use zinc (corrugated) iron sheets as the roofs of their houses, and buy even motorcycles. Sesame, bean, onion and potatoes are sold at Gangaw. Onion and potato were started growing only in 2008; previously, those had to be bought from other localities.

The main products of Zahaw village are groundnut, butter bean, sesame, various flowers, vegetables, chilli, Indian mustard, watermelon, etc. The farm products of the village that sell most are groundnut and watermelon followed by butter bean as the second. Zahaw watermelon is quite famous in Gangaw, Mandalay, Kalay, Kyauktu, Mindat and Matupi townships. There are even buyers who buy the whole watermelon farm in wholesale, costing 6-7 lakhs per acre.

Rice produced by Zahaw village itself is only enough for four months' consumption of the villagers. The villagers therefore have to buy rice for eight months' consumption from other areas, especially from Pakokku. They usually buy rice after selling out groundnut and watermelon. Due to lack of money for growing paddy, they also have to sell their sesame to get agriculture loan. They buy palm oil from other areas to fulfill the oil requirement of their families.

The main farm product of Taung Kin Yan village is paddy. The second one is butter bean and the third ones are sesame, sunflower, ground-nut and other peas and beans. Green gram, pigeon pea, mung bean are sold a little. The brokers from Kanthar (ကံသာ), Mwelai (မ္ဗေလယ်), Kalay and Gangaw come to Taung Kin Yan village to buy

crops. The small brokers who are endowed with advance money buy crops going from one house to another, at the rate of brokerage 200% per basket. Paddy is transported by cars. Although there is the railway link in the area and railway transportation charges are reasonable, farm products are basically transported by cars due to inefficiency of railway transportation arrangement. Though green gram was introduced only in 2004 in the area, it has now been grown economically selling it mainly in Pakokku. Moreover, the hawkers who live in Kanthar, Mwelai villages that stand near the railway line sell extra farm products in the area. The hawkers are generally women (see Figure-5.47) and children, and thus they retain the opportunity of earning extra money for their families.

Myauk Kin Yan villagers produce paddy, butter bean and sesame more than any other villages in the surroundings. The villagers also transport and sell sunflower and other beans to Pakokku and Monywa. The brokerage is just like that of other villages — 100/- to 200/- per basket (sunflower 1basket=32.4 pounds).

Other crops recently grown in the area are sunflower and mung. Taiwan tomato (see Figure-5.48) was introduced in 2010, earning 600/- to 1000/- kyat per viss (1.63 Kg). Local tomato species is a bit smaller than that of Taiwan, as it is grown naturally, earning 50/- to 200/- kyat per viss (1.63 Kg). Local people prefer local tomato (see Figure-5.49) as it is more delicious. The flower species such as Maymyo, thitsapan, and white lilies are grown around the paddy fields and sold in the area, too. After selling their local products, they in turn buy home utensils, TV, video player, bicycles, motorcycles, etc. Due to accessibility to rail road, the hawkers from Chin hill region come to Myauk Kin Yan village daily to sell Chin hill products such as pear, apple, chayote and potato, etc. via Kalay Township.

Though farm products are produced in Kyaw area, the villagers from the surrounding villages come and sell farm products, as the farmland is scarce in the area. Non-existence of wide farmland area to expand further is the cause of low production of farm products. As the corn from Kyaw region was once famous, so the groundnut from Kyaw is now famous for its export to Japan. Thus, timber and various beans are transported to Tamu, India border via Mandalay, Pakokku and Kalay, and to all over Myanmar via Mandalay. The farm product trading now emerges through larger systems in the whole study area.



Figure- (5.47): The women hawkers



Figure (5.48): Taiwan Tomato



Figure (5.49): Local Tomato

Trading forest products

Turmeric (Na-nwin)

Turmeric (*Curcuma Longa*) is grown in the holes that are dug in soil and filled with rice husk manure. From one hole of turmeric produces five vises of turmeric in average lasting for two years of production. The turmeric produced thus is boiled, dried in the sun and powdered before sending and selling at Pakokku. Five visses of turmeric roots being powdered provide one viss (1.63 Kg) of turmeric powder costing up to 3000 k per viss (1.63 Kg). The price of raw turmeric root is 300 kyat per viss (1.63 Kg). The disqualified 'Padauk' (*gum-Kino*) wood is collected by cart in winter and summer and by man power in rainy season. Altogether 30-40 visses (1viss=1.63 Kg) of turmeric powder are available per year and it is sent to Pakokku by car. The car fare from Kyaw to Pakokku is 1000 kyat per head. From 10-15 visses (1viss=1.63 Kg) 1viss of turmeric powder is sold in Pakokku and in turn other household goods have to be bought from Pakokku. Some people sell raw turmeric roots after those were boiled and dried (see Figure-5.50). Ten visses (16.3 Kg) of boiled turmeric root produce one viss (1.63 Kg) of dried turmeric.

Wa-U (*Amorphophallus bullbifer*)

There are two types of Wa-U (*Amorphophallus bullbifer*): the white one and the yellow one with the same price though. Yam tubers (see Figure-5.51) can be bought in the months of Tawthalin (September), Thadingyut (October) and Tazaungmon (November) for 300 kyat to 500 kyat per viss (1 viss=1.63 Kg). According to a woman of 28 years old in Kyaw village, a total of 4000-8000 visses (1 viss=1.63 Kg) of yam tuber are usually available annually, and those are peeled and sliced and again put into trays, (see Figure-5.52) mixed with sulphur powder, and heated. Being dried in the sun, colour change is common and it is therefore usually heated mixed with sulphur powder.

The dried yam tubers are then sent to Mandalay and sold out there. Seventy visses (1viss= 1.63 Kg) of raw yam tuber generally produce ten visses (16.3 Kg) of dried yam tuber (see Figure-5.53). A lot of firewood is to be used for heating process, costing nearly one lakh kyats for firewood annually. The price of yam tuber is 4200 kyat per viss (1 viss=1.63 Kg) for white one and 5000 kyat per viss (1.63 Kg) for yellow one. The product is exported to China via Mandalay.



Figure (5.50): Preparing to boil the Turmeric



Figure (5.51): The yam tubers



Figure (5.52): The peeled and sliced yam tuber put into trays



Figure (5.53): The dried yam tubers



Figure: (5.54): The Indian trumpet pods dried in the Sun



Figure (5.55): The Indian trumpet seeds

The Indian trumpet seed (Kyaung-Sha)

The Indian trumpet (*Oroxylum indicum*) naturally grown in the forest is becoming scarce and so farmers recognize the ones near their farms as their private owned ones. The Indian trumpet in fact is naturally grown in the forests. Its fruit can be eaten as salad and as well as curry. Dried Indian trumpet fruit seeds (known as 'Kyaung-sha-sar') (ကျွန်းရှာ) is sent to Mandalay and sold there in weight.

According to a woman of 35 years old, the price of a pod of Indian trumpet is 20/- to 25/-kyat, and those are bought and dried for ten days in the sun (see Figure-5.54). When dried, the seeds in the pods are taken out and dried again for 2-5 days in the sun. A viss (1.63 kilogram) of dried seed (see Figure-5.55) is sold for 2500/-kyat to 3000/-kyat. A total of 500 visses (815 Kg) of Indian trumpet seed is available annually.

Resin (obtain from resinous wood: *Dipterocarpus Tuberculatus*)

Resin is mostly available in rainy season and winter, but not in summer as it sometimes melts in this season. Resin powder, mixed with kerosene, has been used to fill up the plank joints of boats. Resin is obtained from 'ingyin' (Sal tree). It is used as air-fresher in death ceremonies, and as home paints and oil paints in drawing, etc.

As per a local woman, 1000 visses (1630 Kg) of resin are bought each year for 1400/-kyat per viss (1.63 Kg) and the sales price is 1500/-kyat per viss. Only 100/-kyat profit per viss (1 viss=1.63 Kg) is attainable as the brokers from Pakokku and Mandalay come and buy it directly at the village. In addition, the reduction in weight of resin makes less profit, earning only around 90,000 /-kyat profits per year. It is thus only the extra item that does not bring much profit among other forest products.

Panyo (A Species of Orchid)

Panyo (a species of orchid) (see Figure-5.56) has about 10 species up to 1988-89. At present only three species remain. They usually grow on big trees, rocks and cliffs surrounded by natural springs and falls. Panyo villagers usually cut panyos with knives without damaging the roots, but some people pull it out by roots and some cut down the big trees as those are out of their reach, causing extinction to some of the species. In the long run, it might become one of the reasons for forest degradation.

As per an old man aged over 70, the current panyo has three different species, the fat one, the middle one and the small one. The previous price of panyo is 3/-kyat per viss (1 viss=1.63 Kg); in 1989, 10,000/-kyat per viss (1 viss=1.63 Kg); in 2010, 150, 00/-kyat per viss (1 viss=1.63 Kg) for the fat one, 10,000/-kyat for the middle one, and 2000/-kyat for the small one. There are altogether 10 panyo hunters in Kyaw village, each collecting 50 to 100 visses (1 viss=1.63 Kg) of panyo per year, selling the product at Mandalay. It is said to be used in making beer in China.



Figure (5.56): Panyo: a species of orchid

5.11 Handicrafts

Weaving big bamboo baskets and mats

Myauk Kin Yan village mostly produces paddy, bean and sesame, and accordingly, making and selling big bamboo baskets to store farm products, and making round bamboo sieves and trays, and mats to use in the process of separating seeds become common.

As per the 34 year old weaver of bamboo products from Myauk Kin Yan village, he was taught weaving by his father since he was 12 years old and thus has been interested in the task. Weaving task is generally done in winter as bamboo gets dry in summer and usually hurts the fingers. Bamboo products are produced and sold out on order – the price of a big mat (for two persons) is 7000/-kyat; a bamboo tray/ sieve,

700/-kyat; a bamboo basket (that holds 25 baskets (1150 pounds) of paddy) (see Figure-5.57), kyat equivalence of the value of 2 1/2 baskets (1basket=46 pounds) of paddy: a big bamboo basket (that holds 100 baskets of paddy with bottom lines kyat equivalence of the value of 10 baskets of paddy; a big bamboo basket (that holds 100 baskets (4600 pounds) of paddy without bottom lines), kyat equivalence of the value of 5 baskets of paddy.

To weave a bamboo basket (that holds 100 baskets (4600 pounds) of paddy with bottom lines), 15 bamboo poles with the length of 15 taungs (1 taung = 18 inches) are to be used. A bamboo pole costs 280/-kyat. The bamboo baskets that have already been woven are smeared with the mixture of buffalo dung (see Figure-5.58) and soil of termite hills (Figure-5.59) – content of more buffalo dung is preferable. After completing the task of smearing, the baskets are to be dried up in the sun. From the bamboo weaving work process, an annual income of kyat equivalence of the value of 170 to 180 baskets of paddy is earned that is enough for the annual consumption of the whole family. In some years paddy is sold out to buy another household utensils. The customers of bamboo baskets are from Myauk Kin Yan, Taung Kin Yan, Shwebo and Tharlin villages.

Bamboo raw material is easily available in the area as there are a lot of bamboo groves in the region. Farmers need bamboo baskets to store their crops, and thus bamboo weavers earn money for their living by making bamboo baskets as well. Using raw materials easily available in the surroundings, people make a living accordingly.

Weaving

Of the five villages in the study area, Shon Shi and Zahaw villages engage in weaving to some extent, but it is scarcely seen in Taung Kin Yan and Myauk Kin Yan villages. In Kyaw village area no trace of weaving is found out. In Yaw region it was said that she who could not learn to weave was an ignorant woman, but nowadays sewing machines has actually taken the place of weaving industry compelling every grown-up girl to engage in sewing activities. In Zahaw village, too, every house that has a grown-up girl has at least a sewing machine.



Plate (5.57): Weaving bamboo basket



Figure (5.58): Smearing with the mixture of buffalo dung



Figure (5.59): The termite hill



Figure (5.60): Interweaving with colorful designs



Figure (5.61): Weaving with colorful design

In Shon She village one-fourth of the traditional weavers are residing, selling their finished products in Gangaw and earning round about 5000/-kyat per longyi for males. Female longyis cost more than 10000/-kyat. It takes them three to five days to finish weaving a longyi depending on the time given for that purpose. Gangaw special is the most famous one. The precious Yaw fabrics were generally brown and black ones in color and double width joint (hnanansat) (နှစ်ချောင်း) cotton fabrics are traditional longyis. The yarn used in weaving in previous days was made from locally produced cotton being spinned to get yarn. Indigo plants (Mae plants) are carefully grown to be used as dyes. Previously parents used to give their married daughters looms as an important wedding present. So it is nowadays very common to see looms almost in every house of the village.

Different kinds of fabrics produced by these looms are not only a serious business emblem but also the significant texture of Myanmar culture. At present, weaving has become modernized in the remaining villages of the study area, weaving even the standard textiles with sophisticated colorful designs (see Figure-5.60, 61) interwoven with flowers and floral work. Nowadays, the raw materials needed for weaving such as yarn and dyes are bought from Monywa. The yaw longyis woven by Indian yarn are quite popular. The finished longyis are sent to Monywa, Mandalay and Pakokku via Gangaw.

Tailoring shops

Among the five villages in the study area, there exist a great number of tailoring shops in Taung Kin Yan and Myauk Kin Yan villages. Sewing machines as well as weaving looms are, to some extent, found out in Zahaw and Shon Shi villages. In Kyaw village no weaving industry is observed. In villages where Chin nationals are living mixed, back-strap loom weaving is found out practicing a little.

According to a woman from a tailoring shop in Taung Kin Yan village, there are altogether seven tailoring shops in Taung Kin Yan village, initiating as big roadside tailoring shops in 2007. There are six workers working in this tailoring shop, their salaries ranging 20,000/- to 30,000/- kyat per month. Four sewing-machines, one beating machine and one zig-zag machine are being used. Different kinds of garments such as coats, blouses, bridal gowns, and other shirts for men and children alike are made: 15,000/-kyat (of charges) for a bridal gown, 1500/-kyat to 2000/-kyat and up to

5000/-kyat for ordinary shirts and dresses. In Taung Kin Yan village, each and every house has sewing machines. Although the girls are not clever at making clothes, some are used to make clothes on order. In place of previous looms, the girls, whether they pass their tenth grades or not, learn sewing and try to stand on their own feet. The main reasons for the transformation of their social and economical living patterns are to be concluded on good transportation and communication channels such as TV and video, etc.

Back-strap loom weaving

Of the five villages in the study area, back-strap loom weaving is being practised by one or two weavers in those villages where Chin nationals are living mixed. The purpose is to get family extra income using their leisure time wisely. The yarn for weaving is bought from Gangaw. The cotton bills come from India via Monywa and Kalay. It takes two weeks to complete weaving a longyi, and three weeks for one set of dresses (see Figure-5.62). The price is 40,000/-kyat per longyi, 60,000/-kyat per one set of dresses.

At present, the designs of Chin traditional longyis are quite amazing with magnificent patterns, spots and blocks even more attractive than machine weaving longyis. In fact, weaving process is carried out not only by an individual but also by family members in turn depending on their leisure hours. The traditional costumes are now being sold even in big towns and villages, especially in Tharyargone (သာယာကုန်း) near Kalay, as those are being woven in large numbers.

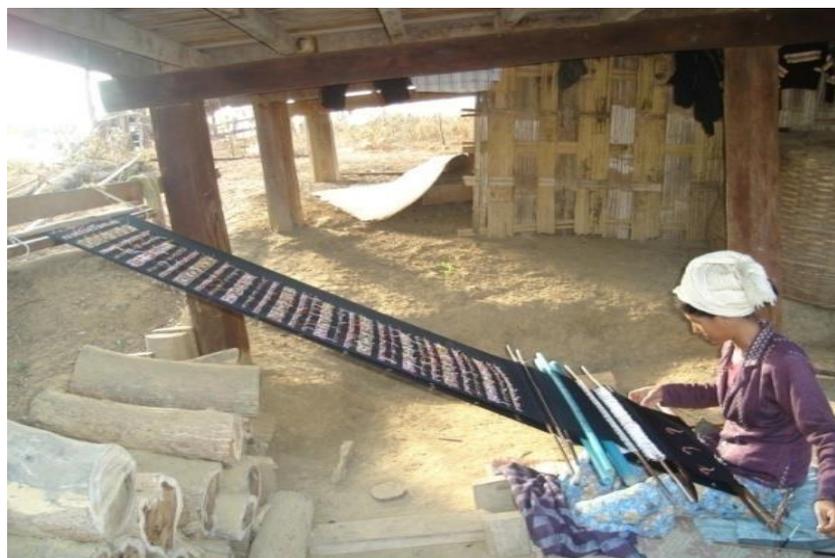


Figure (5.62): Weaving back strap loom

Firewood stove making

Starting from 2009, fuel wood-saving stoves making and selling activities took place in Taung Kin Yan village. Fuel wood saving stoves making method was firstly read in the newspaper, and initiated making and using at home. Production for selling comes afterwards. The strength of the stove is that it is possible to cook while doing other household chores. It is also safe from breaking out fire. A single piece of firewood (see Figure-5.63) enables a rice pot to be done within ten minutes saving much time for cooking. Moreover, as it is fuel-wood saving, expenditure for fuel wood is also saved for the family. Broadly speaking, saving fuel wood will again reduce natural forest degradation and thus bring about environmental conservation.

According to a 56 year old local stove maker, he has to buy the raw barrel at oil field. The barrel is first beaten flat and cut into 9" × 11" pieces with 24" in circumference. The hole for firewood is 3" × 7" with the height of 4" for air-outlet. The mixture of clay and rice husk with the same amount of a tin each is to be smeared up to one inch thickness. To make a fire, wood chips or charcoal can be used. Five stoves can be produced per barrel. A barrel costs 250, 00/-kyat, and so the cost of a piece of barrel for a stove is 5000/-kyat + 500/-kyat for other necessary bolts and nuts. The real cost for a stove therefore is 55, 00/-kyat and its sales price is 7000/-kyat. Necessary bolts and nuts for stove making have to be bought from Kalay. The stoves (see Figure-5.64) are distributed among Gangaw, Kalay, Natchaung, Tharlin, Shwebo villages. Only a total of 200 stoves are annually produced and distributed due to financial constraints, lack of man power and unavailability of barrels. Our family is a big one and three cart's load of firewood was formally required per month. One cart of firewood costs 35,00/-kyat, and so the expenditure for firewood per month is 10,500/-kyat through using firewood-saving stoves, only one cart of firewood is required, saving two carts' load of firewood, that is 7000/-kyat per month (7000/-kyat× 12 months = 84000/-kyat per year) is saved.

The commitment is in some way a good example of taking part in the campaign of environmental conservation because should a family household save two carts' load of firewood, 100 family households will save 200 carts' load of firewood – a good practice for fighting against trees and forests degradation. Provided that such practice is exercised both individually and nation-wide, the natural trees and forests will be

conserved and rehabilitated, and thus the global climate scenario will improve quite a lot.



Figure (5.63): Cooking with a single piece of Firewood



Figure (5.64): Firewood stove

Making wood-based products

In producing wood-based products, Padauk (*gum-kino*) and ‘thitmalan’ are mostly used tree species. The products are mostly produced in winter, but a little in rainy season. In summer, it is not used to carry out the task due to the effect of hot weather to the wood. Using saw machines, (see Figure-5.65) the timber (usually disqualified timber) has proportionately to be cut as per the designs in the design book. Different kinds of vases, (see Figure-5.66) small containers and decorative dolls and toys are commonly made and sent to Mandalay and Monywa.

There are two workers: one daily wager (3000/-kyat per day), and a salary man (100,000/-kyat per month). The products are sent to Mandalay and Monywa at least once a month. A total of about 4,000,000/- kyat (40 lakh) are earned per year. The

disqualified timber, instead of using as firewood, is used in making beautiful utensils and decorative dolls and toys, and thus, enabling extra income, upgrading social status and enlarging livelihood activities.



Figure (5.65): The timber saw mill



Figure (5.66): Different kinds of vases

5.12 Sale of customer goods and commodities

In Gangaw region, separate shopkeepers are hardly seen in olden days. No one sits and sells things the whole day as he/she has to do different kinds of activities – working in the farm, selling farm products, and home - made handiwork products at the market (five days market place), etc (Myint, Tin, 1992). Fish sauce was not formerly consumed in Gangaw region until 1950. After that fish sauce as well as iron nails and textiles have been purchased and utilized.

Self sufficiency and the market in Shon Shi Village

There was a city development compulsory market in Shon Shi village in 1970 with a total of 20 shops. As the bridge spanning the Myitthar River was only the level of suspension bridge, the development of Shon Shi village was not very satisfactory. In previous days, dugout boats were used to transport local products and to buy such things as fish-paste, dried fish, rice, kerosene, soap, salt, chili, onion and clothes from Monywa and Kalay, taking about a month for a return trip.

Jaggery (palm tree sweet, Htan-hlyet) needed to produce crispies (montlaypway) (မုန့်လေပွေ) and pop corn rolls had to be bought from Pakokku and Myaing. The livelihood activities in olden days were very hard due to transportation constraints causing waste of time, physical and mental exhaustion, etc. At present only small-

scale vendors and home shops exist in Shon Shi village, (see Figure-5.67) no separate market at all. People buy fish paste, dried fish, dried shrimp and salt from East Gangaw bazaar. The reasons why Shon Shi village development market disappeared were that only the Myitthar river stands between Shon Shi and Gangaw town, and Shon Shi and West Gangaw stand along side with each other, and thus the commodities required can be bought from the markets in those towns. Home shops have been initiated in Shon Shi village since 1988, most shop owners are Chin nationals with an exception of one Myanmar national. Home shops have been increasing since 1991 and in 2010 there exist 30 shops (see Figure -5.68).



Figure (5.67): Home shop in Shon Shi Village

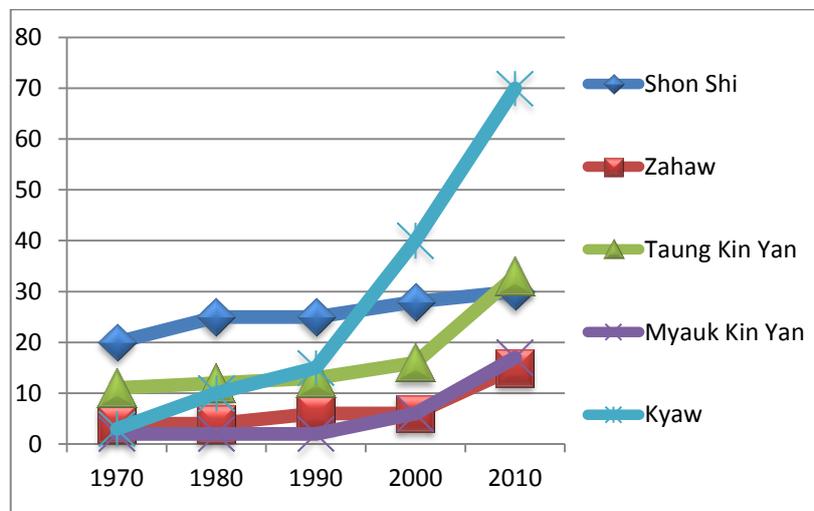


Figure -5.68: The status of trading and existence of home shops in the study area

Source: Field survey in 2010-11

Self sufficiency and the market in Zahaw Village

Zahaw villagers had to cross the river to buy things at Monywa and Kalay. After 1988, home shops have increased and due to the emergence of Pale-Gangaw road, marketing of salt, fish paste and garments has initiated. In olden days, due to the scarcity of rice, the combination of rice and corn was commonly consumed. Nowadays due to the increase in local crops production and having to sell groundnuts at a high price, it is quite possible for the villagers to buy and consume rice; even good variety of rice consumption is very common.

The Zahaw-Gangaw Bridge that spans the river at present has been built of bamboo by the villagers themselves on self-help basis yearly. No big cars can cross the river through the bridge, thus resulting in the limited trading. There were six home shops in 2000, but in 2010 up to 15 shops increased (see Figure-5.68). Consumer goods are easily available even at village shops. Ready-made cloths, umbrellas, slippers and sandals, biscuits, cold drinks, groceries, cosmetic, coconut oil, stationary, farm tools such as choppers, spades, buckets, aluminum pots and pans, etc. are also available. Due to the existence of these home shops, necessary things are easily purchased even in the village without having to go up to Gangaw and buy things, and thus saving time and energy.

Self sufficiency and the market in Taung Kin Yan Village

Around 1979, going shopping to Monywa by boat took 3-4 days. Boats sometimes capsized in the Chaungkauk (ချောင်းကောက်) creek. Boat fare was 300/-kyat per head, and 3/-kyat per viss (1.63 Kg) of goods. Boat owners used to serve meals free of charge. In rainy season, passengers had to drink unclear creek water, sometimes having to suffer from diarrhea. In 1985-86, fast boats came to exist and it only took a night's sleep to Gangaw by fast boat.

After 1988, transportation becomes convenient and trading consumer goods directly by companies from Yangon as well as Pakokku was addressed. Both wholesale and retail systems were practised. In 2000, there were 16 homes shops, but in 2010 increased up to 33 (see Figure-5.68). Dress making shops, hair dressing shops, motorcycle spare parts shops, corrugated iron shops, nail and hardware shops, and even computer shops exist at present. Though there is no separate market, licensees

for pork has already emerged. Meat and fish are sold by vendors as well as by sellers on bicycles (see Figure-5.69).

Hot item goods are salt, paste fish, soap, artificial sweeteners and garments that are bought from Kalay, Gangaw, Pakokku and Mandalay. Myanmar traditional medicines and western medicines are sold by drug stores, especially; local traditional medicines such as Aphyaykyaw (အဖြေကျော်) and Phothanchaung (ဖိုးသံချောင်း) are hot items.



Figure (5.69): Selling meat on bicycle

Self sufficiency and the market in Myauk Kin Yan Village

There are more home shops in Taung Kin Yan village than in Myauk Kin Yan village. The main consumer goods that are sent to Myauk Kin Yan village from Pakokku, Kalay and Gangaw are salt, fish paste, artificial sweeteners, soap, turmeric, and garlic. After the construction of railroad and Taung Kin Yan dam, the villagers have strengthened in farm activities. Most households of Myauk Kin Yan own 3-4 motorcycles. In 2005-2006, there are motorcycle and spare parts shops in the village.

Farm products such as bean and sesame are sent to Pakokku and tea is bought from Pakokku back home. The tea from Chin hill has been bought starting from 2008. Hawkers from Chin hill sometimes come to Myauk Kin Yan village and sell Chin products such as different kinds of crops and tea. A vast area of farmland exists near Myauk Kin Yan village and the delivery of water by Taung Kin Ya dam has

encouraged Myauk Kin Yan villagers to boost their farm products. They devoted their time and energy only in their farm work and thus neglected other livelihoods resulting in the existence of only 17 home shops in 2010 (see Figure5.68).

The villagers usually go to Tamu on motorcycles and buy made-in-India aluminum pots, textiles and consumer goods within a day. Due to the existence of railway transportation and cheap train fares, villagers go to Kalay by train and buy garments and cosmetic in stores, and even have meals at restaurants. Through the development of trading, the living standard of the villagers has obviously become upgraded.

Self sufficiency and the market in Kyaw Village

The Pale-Gangaw road initiated in 1962 and completed in 1968. At that time there were only three home shops in Kyaw region. It was, therefore, to buy salt and jaggery (palm sugar) to consume for the whole year round from Myaing (မြိုင်မြိုင်) and Pale (ပုလဲမြိုင်). The hawkers always come from west hill to sell mushroom, bamboo shoots, water melon, thanakha, resin, honey, etc. Meat such as dove, partridge, barking deer, wild boar, rabbit, etc., is often available. The villagers use carts and coolies to buy goods that are to be resold at home shops. The transportation charge rate is 10/-kyat per cart. In olden days, it was to walk up to Yinmarbin (ယင်းမာပင်), Tamarbinzu (တမာပင်စု), Chinpit (ချင်ပစ်), Monthwin (မုံသွင်), or to hitch hike military trucks or timber board trucks to get to Monywa (Myint, Tin, 1992). As a result, only a small number of home shops existed in those days. In 1980, it increased up to 10 home shops, and in 1990, 15 home shops. (see Figure5.68)

Due to the railroad in the area (lasting 3 years from 1995-96 to 1998-99) more workers were needed. Thus workers from other regions arrived by thousands. The local people sold rice, edible oil, salt, meat, fish and vegetables to the workers, thus increasing their income significantly. Moreover, women also participated in income earning opportunities such as sand and gravel transferring work. There were altogether more than 400,000 labourers in bridge and railway construction work. Timber contractors with the Ministry of Railways Communications engaged in timber contribution. A total of more than 40 contractors engaged in the construction of Yay-Tavoy (ရေးထားဝယ်) railroad section and Saikkhaung-Namsan (ဆိုက်ခေါင်-နမ့်ဆန်)

railroad section. The bridge spanned the gorges and gullies with the length ranging from 6 feet to 100 feet.

When railroads were being constructed, labour contribution by every household was required. Due to adverse weather and hard living conditions, the rich men had to hire labourers to replace their quota. In this case, job opportunities were again created, favoring daily wagers with an increase in their income.

On the other hand, as there were thousands of labourers, there occurred water-borne diseases due to scarcity and impurity of drinking water. When the railway station was being built in 1996, at least a person died daily due to malaria and cholera. The situation was relieved only when the government hired out excavators and the village chairman undertook diesel charges. There were, however, some cases that affected the poor villagers who were not able to hire labourers.

A 53 years old local resident of Kyaw village said that UNICEF supported water supply system for Hospital compound of Kyaw village during the construction project of railroad. Families of all villages had to involve in both water supply and rail road projects so that they did not have time to go other work like agriculture, odd jobs and small business. Thus people faced hardship in their life as they stopped working their income generating tasks. There were some other situations which affected the health status and increased their mortality. Those are; (i) there was no protective shelter in the forest (ii) the forest was very deep (iii) poor nutritional status. It was also found out that young people and school going age group could not go to school as they had to involve in different jobs to earn money.

After the construction of railroads in 1995-96, home shops have remarkably increased in Kyaw region. In 2000, up to 40 home shops have been counted (see Figure-5.68) due to such reasons as the location of the village on Monywa-Pale-Gangaw-Haka road and near oil field, construction of railroad, road construction activities, the migrant workers, etc.

The oil extraction business reached its prime time in 1995-2000 and accordingly the sales of country liquor has increased up to 3000 bottles per day. The sales of whisky and beer have also increased remarkably. The physical development (infrastructure) of the area has thus gained but on the other hand the minority of local people has been suffering from health hazards both physically and mentally.

Almost all villagers of Kyaw village own farmland and cattle. Later they sold out their cattle after harvest and set up oil wells (see Figure-5.70). A set of oil extraction

machine costs about 10 lakhs + labor and other expenditure 20 to 50 lakhs per oil drilling well. Through such ventures, 90% of them attained economic gains and were able to build concrete houses and to buy cars, upgrading their living standards. However 10% of them were not lucky enough to have economic success.

There are two types of crude oil: the thick one and the thin one. The thick one is refined before use but the thin one can be used directly. Moreover, “Sinopet’ (စီနိုပက်) Co. from China engaged in oil drilling business, creating job opportunities for local people. A local cook earns kyat one lakh per month, a laundry man 150,000/-kyat per month. Women also had job opportunities and earned extra income for their family.

The most productive year of oil extraction in the area is 2000. In olden days, oil extraction was carried out manually. It took ten months to dig an oil well up to 70 feet deep. Nowadays machines are used, digging up to ten feet a day. The crude oil extracted thus is sold to oil companies. A productive oil well (see Figure-5.71) produces 6 barrels a day. There are certain wells that produce 2-3 barrels a day. Some oil wells are deep up to 600 taungs (one taung = 18 inches). Because of oil companies, the sales for chilli, onion, salt and fish paste have been increased in Kyaw region.

The ironwares and pipes needed for use in oil fields, and materials to make alcohol are bought from Monywa and Mandalay. Trading has compelled the local people to become merchants and contractors who eventually have grown rich. Due to booming trading business, the plots on both sides of the road of Kyaw village become very expansive. The rate of charges for house letting has also increased. Standing between Pontaung and Ponnya mountain ranges, Kyaw village was once difficult even to be accessible to, but it now becomes prosperous fabricating with motor roads and railroads, endowed with various consumer goods as well.

During the period 2000-2010, every house beside the road has transformed into home shops (see Figure-5.72). The village that located on Mandalay-Gangaw-Haka road is now a prosperous village. The traditional Yawlongyis (ယောလုံချည်) and shirts for both men and women and Yaw shawls are being bought by the traders from Sagar (စကား), Kanthit (ကန်သစ်) and Noneygi (နုံးကြီး) villages and resold at Kalay and Tamu. They again buy Tamu fabric, Indian steel wares, steel pressure cookers, grinders, garlic, onion and groundnut, reselling them on both retail and wholesale. They resell it at a profit of 500/-kyat per item; the investment ranges from 2 lakhs to 9 lakhs per trip, two trips per month. As there are a great deal of company workers, local workers and migrants, the commodities bought and carried from Kalay and Tamu are sold till those run short of.



Figure (5.70): Oil wells near Kyaw Village



Figure (5.71): A productive oil well



Figure (5.72): Home shops beside the road in Kyaw Village

Case Study .I

A 53 year old local resident (Kyaw village): I got retired from my school master job in 1977 and started to run a home grocery shop around 1979-80. In 1990, I again started timber trading. I extended business dealings up to Mandalay and Yangon and sold timber directly dealing with export companies. I thus managed to build a concrete house in 1990. I engaged in timber trading business for two years. In 1994-95, the railroad construction began and the railroad engineers encouraged me to commence contract job in bridge and building construction as the persons from other localities were not interested in the job as it required to go into jungle. I thus got a bridge building contract in 1994-95. I failed to hire a truck to transport brick and sand, so I bought a TE.11 for 10 lakhs in 1996, which is still in use.

During the construction period of railroad, the whole area was congested with a great deal of people flooding into it from various localities. Not only consumer goods but also thousands of 7-8 pound hammers were sold leaving me with a lot of profit from sales. Suffering from malaria and cholera caused by impurity of drinking water and bad management of shelter for workers, death cases were quite common everyday. As I also had got contract for building a Railway Station, I had to purchase medicines and submit to the hospital for 20% profit. When Namsan (နမ့်ဆန်) railroad started to construct, our group of contractors got a contract to build 12 bridges. There in Namsan we could see the sun only at 9 a.m., and at 3.00 p.m it usually disappeared. We were severely fought by a flux of mosquitoes. After the completion of three bridges, I was totally beaten by the mosquitoes and had to suffer from malaria. For fear of being dead suffering from malaria, I drew back home at last.

In 2001, I went to Mokok (မိုးကုတ်) to start mining business, worked there for two and a half years, but with a total failure I had to return home. After the completion of railroad construction, I bought a truck and transported logs from the forests to Pakokku up to 2005 but car charges were paid only at the end of the year. As a result, I sold the trucks in 2006 and bought an excavator where charges for excavation work was paid monthly. Now I own two Bed Fords, one car for family use, and two Dozers (earth carriers).

Case Study .II

A 70 year old local resident (Kyaw village): I owned a rice mill and an oil mill. I bought jaggery and Virginia from Pakokku and sold them at Chin hill again. It was not OK. In those days, trading oil and rice was illegal. My wife was illiterate and so not convenient in social dealings, thus after two years' service of running rice mill and oil mill, I sold them all including my truck car. After selling the car, the prices of cars went up. Transporting logs by truck cars was booming again. I hired a six-wheel truck and started the business. I gained profit for about 30 lakhs from dealing in 'Padauk' timber.

When railroad construction began, I shared with my younger brothers and engaged in contract business for bridge building, and thus I was able to build a brick house. I stopped doing timber trading and started bean, corn, sesame, jaggery, etc, but I was a failure in that business and lost all my belongings including 20,000 visses (1viss=1.63Kg) of jaggery, 300 baskets (1basket=72 pounds) of pigeon bean, and 700 baskets (1basket= 72 pounds) of wheat. Thus I decided not engage in any business dealings and took a rest for 4-5 years. In 1995, I started to run home shop for my daughters and it has still been running up to now in a stable condition.

Case Study III

A 54 year old local resident (Kyaw village): When railroad construction had begun, I engaged in the contract work in 1996-97. In 2000, I started oil drilling business for three years. After that more and more people engaged in this business and oil wells became deeper and deeper up to more than 167 'taungs' (1 taung = 18 inches). I was not lucky enough to gain success in that business. All the money gained from contract business were gone losing confidence was worse than losing money. In 2003, I ran a shop and sold things again. As my sons and daughters were still in their school going age then, I was forced to do that. I also ran a video show room. I now buy commodities from Pakokku, Monywa, and Mandalay through 'pay-for-the-old-and-get-the-new-one' system transmitting money by post office. As there are a lot of workers working there, trading business is quite booming, especially selling things to migrants rather than local residents.

In this five study villages, Taung Kin Yan village where the Taung Kin Yan dam is located and Myauk Kin Yan village have improved a lot in agriculture. Myauk Kin

Yan village not only managed to improve the yield per acre but also succeeded in extending cultivation land areas. Due to the development in agriculture, 50% of the village population are migrants who came to the village to earn their living. Not only paddy land areas but also some of the farmland areas are now being irrigated. As Shon Shi and Zahaw villages do not have government dams, villagers only depend on hand-dug dams. Due to good transportation and communication, the area has developed to some extent. Since Kyaw region is the main centre for transportation development, trading business has developed more than other regions. There has no development in agriculture sector as Kyaw region has no virgin land to make room for farms, and they can easily make money by doing another trading business preventing them from doing farm work.

CHAPTER (6)

THE SOCIAL RESPONSE TO CULTURE CHANGE

In this chapter, the pattern of family organization and the use and management of central fund have been modeled. The settlement patterns built on the natural resources that are easily available in the locality have also been included. In the education sector, the increase in schools due to convenient transportation and communication has been mentioned. Moreover, altogether five FGIs (Focus Group Interview), one FGI per village, have been organized in order to find out the culture of schools. In regard to mass media, economic opportunities due to media and the disappearance of some traditional cultural values caused by the influence of alien cultures were pointed out. Moreover, as the fact that the role of social associations is the most important one in carrying out regional development it was also described in this study.

6.1 The cultural ecological perspectives of the household

Myanmar nationals and Chin nationals live in Gangaw Region together. In their settlement patterns, their houses are built with bamboo and wooden posts and planks for floors and walls which are available in their natural environment. Most of the houses in the villages are raised above the ground, tall houses to a height of five or six feet. Under their houses, they raise cattle; (see Figures-6.1, 2) keep almost all drawing carts and ploughs. Villagers domesticate fowls, ducks and pigs.

Teak (Kyun- *Tectona grandis L.f*), is not accustomed to being used in building houses in the region as cattle and pigs dispose dung and urine under the houses, and in this case teak is not salt-resistant. "Ironwood" (*Xylia xylocarpa (Roxb) Toub*) Pyinkado is traditionally prohibited for use in building houses because when building 'natnan' (house for spirits) of 'Ahmayeyin natnan', ironwood is usually been utilized as posts of 'natnan'. Moreover, "ironwood" is very hard to nail, which is one reason for not using it. Generally, Ingin (*Shorea siamensis (Kurz) Miq*) which is salt-resistant is used to build houses.

There are a living room, bed rooms and a kitchen in front of the house which is separately built. They use firewood for cooking (see Figure-6.3). In olden days, there used to be the doors and windows without the panes on them. At present, in some villages and towns, houses and buildings built with bricks are quite common. Bricks

are being manufactured even in the locality. Not only windowpanes are installed but also ornamental tiles are utilized in building houses nowadays. In Gangaw town area, standardized housings and office buildings make up the modernized and developed social living style of the townspeople. Some household families run home convenient stores even at their houses. It is observed as the creation of job for the family to earn extra income.

Though traditional farming takes place in Gangaw region, modernized cultivation methods utilizing tractors, winnowers, combined harvesters, and threshers, etc., are being used in Myauk Kin Yan area. Similarly, the households along the Kyaw village main road run convenient stores due to better transportation and communication, existence of natural oil extraction sites, building dams and extension of railroads, forming the local area as an economic centre.

Accordingly, the price of a piece of land (35ft x 60ft) along the village main road of Kyaw village is estimated to be about 100 lakhs, but the ones that are not on the main road are only 15-20 lakhs. Since the village has developed into an economic centre, it is observed that there has grown a little gap in the strata of society. Nevertheless, the local economic management of the households is just the same.



Figure (6.1): Cattle under the house



Figure (6.2): Cattle under the house



Figure (6.3): Firewood for cooking

The household unit

The household of Gangaw region consists of a married man and woman with their children. The basic family consists of relatives who are from both sides of the family, two mature opposite sex who live in a union recognized by other members of their society, and their children. When the households of the olden days of Myanmar nationals of Gangaw Township were studied, male offspring left his family at marriage and went to live with his wife's family. Nowadays, a married couple can choose to live either with the boy's parents or the girl's parents for as long as three years according to their economic exploitation. The couple then establishes an independent household.

A local resident of Zahaw village said, "When I was 11 years old, my parents built a new house for me to live when I get married. But I didn't move to this new house after having got married. I have lived with my parents-in-law. Moreover, I spent my life cooperating with my parents' business and I also did my own business. There was nobody to help my parents in their business as I was the only child. My wife also helps her parents' business and we have gradually saved some money. We lived with my parent-in-laws for about ten years until we got three children. They sent our children to school and we only needed to give them some money for their snacks. Only when we could stand on our own feet, we moved to our own house and tried to lead a separate life".

Originally Chin Nationals practised Patrilineal kinship system. That is, they counted as relatives only the kin from paternal side. At that time, the male offspring at marriage continued to reside in the family dwelling and added their wives and

children to the group. Female offspring correspondingly left the paternal residence at marriage and went to live with their husband's family.

But now, Chin nationals living in Gangaw region regard both sides of the family as relatives. They can choose to reside either with paternal side or maternal side according to their economic exploitation. Though they live with their parent's family, the married couples own his or her business privately.

Now, though father is said to be the authority in family affairs, mother can also express her desires. The father also is now obliged to take advice from his wife. Not only the mother but also her sons and daughters now can give advice to their father on family affairs. So though it is said that he is the authority, practically he has to share his authority with other members of the family.

The father, who is the head of the household, has to carry out the work in order to earn money for his family, neglecting his own benefits, to make his sons and daughters happy and contented, and to be able to live in full swing. The mother also solves the problems doing her own duties as well. The sons and daughters carry out household affairs and have to work to earn a living in accordance with their own interest and enthusiasm. Nevertheless, father, mother, sons and daughters are coordinating and collaborating with each other to make ends meet. To settle the financial problems of the household, the closest relatives from paternal side or maternal side used to take the responsibility.

Household decision making

Traditionally, the nationals in Gangaw region engaged in farming. Transportation in Gangaw region has now improved, leading the local people to run convenient stores, to own ten-wheel trucks and excavators, etc to get contracts for road and bridge construction and to take part in the extraction of oil as per the environmental situation of the locality. As a result, economic management in the household becomes more complicated. However, traditional economic management is very much the same.

Households set their production targets in relation to other households, below their optimum capacity. The mechanical solidarity of the household encompasses a simple gender-based division of labour that is linked to low work intensity. Men contribute to household fund of capital and permanent goods of value, while women do not. Women put more into the household maintenance fund than their husbands.

One part of the problem is that money, labour, and food are not equivalent within the household economy. Money becomes more important in the household. It provides an uncontrolled and objective standard of value that undercuts existing concepts of equivalence.

Some households are taking advantage of new economic opportunities. Peasants in that area grow crops using agrochemicals expanding their cash crop production. They set up small retail shops and buy trucks for hauling freight. Income earning methods of the households are thus slightly different from each other, and their decision-making on income distribution is not similar in each household as well. Some households save money, but some do not. Some households are able to invest their cash income in new economic enterprises. It appeared to be the way they managed their household economics. Households pooled their labour and money and channeled it into productive investments. So, normative value of how household members should behave is the same in this Gangaw region.

Though the husband is the head of the household, such critical affairs as social, economic and daughters and sons related are consulted with the wife before decision-making is reached. Thus, household decisions are seen as inherently bifocal succession. They are simultaneously concerned with their ostensible object, and with maintaining or changing the household itself. Decision-making is thus reached in order to maintain marriage.

Households maintain a series of different funds for a particular purpose. They imply their properties in order of hierarchy. The most basic fund is filled; the overflow goes to the next, and so on, leaving discretionary funds for the last. Moreover, when the crop is in, the small profit fund is used to buy gold and repair their house.

With regard to inheritance, both sons and daughters have the same right. Moreover, for Myanmar nationals, the property used to pass by inheritance to the youngest daughter and for Chin nationals to the youngest son. The rich parents carry out the process while they are still alive. If the inheritance distribution process has not yet been conducted until the parents are dead, the elder uncles and aunts in the kin used to take the responsibility of the inheritance passing process instead. Grownup sons and daughters in the family have different economic points of view. Cooperation and collaboration among others is also observed in the households.

Figure- 6.4 shows a working-class Myanmar household in Gangaw region. The husband does not split his income, but gives all his income to his wife as central fund. He takes some money for his own personal discretionary fund. Part of his discretionary income goes for his personal items like beer, tobacco and betel quid and

another part goes for periodic household expenses like large bills, furniture or social costs. The wife controls a single central fund which includes most agricultural products, cash from selling crops, and the cash income earned by all members, including children. But decision-making about expenditures from the central fund in these households is often negotiated between husband and wife. They manage to divide it as major expenses, housekeeping money and investment. The wife's wage also goes into the central fund and she takes some overflow to pay the costs of substituting services like child care. Children's wages go to the mother, who puts some in the central fund, and returns some as allowance. Households generally used to saving money. The money thus saved is usually used to buy necessary pieces of land for farming, cattle, gold, etc., so as to serve as 'bride price' (ശ്യാമം) on occasion that the sons have grown up and got married.

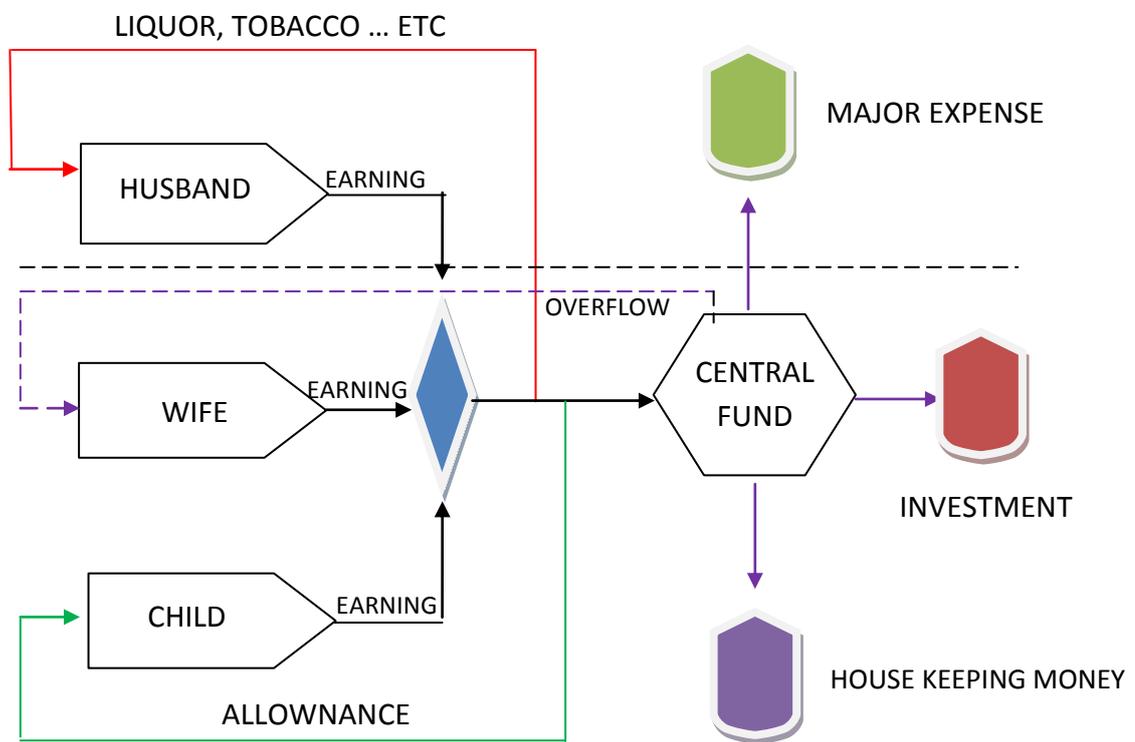


Figure-6.4: A model of funds in a household of Gangaw Township under the management of housewife

6.2 Relationship between education and village environment

Shon Shi Village: The first education system for it was monastery education. U Ohn Saing who was established to start this monastery education. On June 1st 1952 primary school (monastery education) was upgraded to middle school government and was promoted to affiliated high school in 1973. On June 1st 1991 the affiliated high school was again upgraded to high school by the government (Yoan Maw.U, 1995) (see Table-13). There was a library in the village and villagers used to celebrate poem and essay contest.

Zahaw Village: Primary school was established in Zahaw in 1913 and has been promoted to Middle School (branch) since 1996 (see Table-13). The management for the class grade 8 and grade 9 is done by Shon Shi High school since the type of middle school is not fully established middle school.

Taung Kin Yan Village: Pyitawthar primary school was started in 1954. There was only one teacher and 25 students at that time. In 1972 it was promoted to affiliated middle school and management was done by Mweleh (မေ့လေ့) fully fledged middle school. Five primary school teachers and two middle school teachers were hired from other village to run the school. The village had to provide 100 baskets (7500 pounds) of rice per year to each teacher together with free meals. There were about 25 students. The school was promoted to full fledged middle school in 1986. For those students who passed the grade 8 had to go Mweleh high school for the remaining two levels. Taung Kin Yan Middle school accommodated 180 students at that time.

In 1990 the middle school of Taung kin Yan was promoted to affiliated high school where three graduates within the village were hired as teachers. Each teacher was paid 3500 kyat per month as salary. Students from other villages were given free accommodation in the village as part of the incentive to join the high school. The affiliated high school became government recognized high school (branch) in 2003 (see Table-13).

Taung Kin Yan high School (branch) had its own rice field and usable land plots and cultivation was done in these areas and rice was sold out. The benefitted money was used for renovation of school, procurement of furniture for school, per diem for employees and teachers. Fund was also used for financial and stationery support to poor students.

Myauk Kin Yan village: Myauk Kin Yan primary school was established on September 1st 1946. It was promoted to affiliated middle school in 1972. Children from nearby villages attended the school that was about 30 in number at that time.

Those children from other villages were given accommodation and meal free of charge as incentive to attend the class. The cost for stationery and school books were born by their parents. Students who passed the 8th grade had to go high school which was situated in Natchaung, Kan, Kalay and Gangaw. Each student who went to attend high school in other area had to pay 10 Pyis (468.75pound) of rice and 10 viss (16.3 Kg) odd cooking oil for accommodation and meal. Their parents had to contact close friends in these villages and town to get support to get enrollment in the high school. Students came back to own village in the weekends on foot. In 1991, this affiliated middle school of Myauk Kin Yan became middle school (branch) and was promoted to high school (branch) in 2004 (see Table-13) and was managed by High school from Kan village till now.

Kyaw village: In Kyaw village the middle school was started in 1970 and became affiliated high school in 1990. Villagers had to take responsibility to get and find teachers for the school. The school was promoted to high school in 2010. Communication in terms of transport became better in Kyaw village after 1988. Thus education sector was also expanded.

Table- 13: Historical development of education in Gangaw Township

	Monastery school	Primary school	Affiliated Middle school / Branch	Affiliated High school/ Branch
1913		Zahaw		
1916	Shon Shi			
1946		Myauk KinYan		
1952			Shon Shi (Middle School)	
1954		Taung Kin Yan		
1972-1973			Taung/ Myauk Kin Yan (affiliated) and Kyaw (Middle School)	Shon Shi (Affiliated)
1991				Taung Kin Yan and Kyaw(Affiliated)
2000				Kyaw(High School)
1996 on ward			Zahaw(Branch)	
2003/2004 on ward				Myauk /Taung Kin Yan (Branch)

Table- 14: Students and Teachers number in Shon Shi high school

	Number of teachers			Number of students		
	male	female	total	male	female	total
1990-91	*					
2000-01	2	8	10	76	93	169
2009-10	4	10	14	47	72	119

(*) turn over was very high among teachers in Shon Shi during 1990-91 so that the number could not be collected (see Table-14).

Table- 15: Students and Teachers number in Taung Kin Yan high school (branch)

	Number of teachers			Number of students		
	male	female	total	male	female	total
1990-91	3		3			
2000-01	3		3	40	50	90
2009-10	2	3	5	24	45	69

Though high school at Taung Kin Yan village was opened in 1990-91 the number of students was high among classes grade 8 and 9 but grade 10 and 11th students were not at all. In 2000 there were 3 teachers and 90 students at grade 11th (40 boys and 50 girls). In 2009-10 the number of students at grade 11th was 69 (boys = 24 and girls = 45) (see Table-15). There were altogether 12 subjects at grade10 and grade 11 (Arts and science). So, there have to be at least 12 teachers in each high school. The ratio between teachers and students was not compatible.

Table- 16: Students and Teachers number in Myauk Kin Yan high school (branch)

	Number of teachers			Number of students		
	male	female	total	male	female	total
2009-10	1	5	6	21	27	48

Though high school was opened in Myauk Kin Yan in 2004 there were no students at that time. In 2009-10 there were 6 teachers and 48 students (see Table-16).

Table- 17: Students and Teachers number in Kyaw high school

	Number of teachers			Number of students		
	male	female	total	male	female	total
1990-91	6	9	15	19	21	40
2000-01	5	24	29	49	83	132
2009-10	4	30	34	36	63	99

Affiliated high school was started to open in Kyaw village during 1990-91 and there were 15 teachers (6 male and 9 female) and there was 40 students at grade 11th. The school became government recognized high school in 2000-2001 and 29 government appointed teachers (male = 5 and female = 24) joined the school. There were 132 students. In 2009-10 there were 34 teachers (male = 4 and female =30) and 99 students at grade 11th. Thus attendant rate at Kyaw high school became went down again (see Table-17).

6.2.1 Structure of the learning environment

Table-18: The schedule for schools in 5 study villages

Time	Schedule
8:45 am	Start Class
10:30 am	Snack Break
11:15 am	Resume Class
12:10 pm	Lunch Break
3:45 pm	Close Class
Weekend and Government Holidays	Class Holiday
During Buddhist Lent months	Class Close on Sunday and Sabbath Day

The extra class was opened for the class 11th grade which reflected teachers' dedication to students. The uniform for both students and teachers is white blouse / shirt and green sarong. Teachers wear this uniform every day but students have to wear on Monday, Wednesday and Friday as students should attend school assembly on these days. On assembly days students have to recite national anthem and students'

ethics and listen to principal's guidance and instructions. Once students enter their own classroom they have to pray for Buddha and recite Buddha's teaching. There is no strict rule to wear student's uniform for the class grade 1 and 2.

Primary level students are allowed to use pencils and secondary and tertiary level students are allowed to use ball pen. Teachers use blackboard and chalk for teaching purposes. Each class has to support school gardening of mustard in the premise of school where each class is being given one plot to do that. Earning money from selling mustard makes fund for each class that is used for procuring stationery and other necessities for the class and distributed to poor students. Mustard is also provided to students and teachers for consumption.

Students in the school are grouped into four in the name of red, yellow, blue and green. Each group is assigned for specific day of the week for involving in environmental sanitation and cleaning of classes. Girls are assigned to change flowers and clean pots to be used for Buddha shrine in the classroom. Boys are assigned to fetch drinking water (see Figure-6.5, 6) for their own classes. Each class has a monitor (student's leader) and a boy is usually assigned for that. Student leader has to monitor other students to make the discipline in place. On the first days of each semester money is collected from affordable students to buy broom and water pot. Environmental sanitation for the whole school is usually done on Friday. One activity which is done in one study area was mentioned as follow:

"We together with students make school gardening on a kind of tree (Thanakha, Shin-Ma-Taung), the bark and root of which are used in making fragrant paste for cosmetic purpose. Each tree is named with the name of each student who has to grow and look after till the tree becomes a big one and to be sold out in the market. The money is used to buy computer for the school and also used to feed nutritious food to students 1-2 times per month. We usually feed chicken porridge to all students (see Figure-6.7, 8) on those days" (53 year old senior teacher of Taung Kin Yan School).

School health education is usually given to students. The topics cover food and nutrition, balanced diet, prevention of communicable diseases, personal hygiene, chiropody etc. School health team visits school three times a year to check for teeth, height, weight, and other basic medical problems. In all study areas school buildings are with brick foundation, wooden wall, corrugated sheet roof but some are made of bamboos. There are plenty of school premises (see Figure-6.9) where school gardening (see Figure-6.10) is established.



Figure (6.5): Boys assigned to fetch drinking water



Figure (6.6): Boys assigned to fetch drinking water



Figure (6.7): The students having chicken porridge



Figure (6.8): The students having chicken porridge



Figure (6.9): School premises in Kyaw Village



Figure (6.10): School gardening in Zahaw Village

6.2.2 Extra subjects teaching in the school

The teaching method in the school includes discussion and explanation of the lesson, practical session on English and Mathematics in the classroom, homework on the subject of History and Geography. The topics cover both teacher's as well as student's choice. The topic on civic duties is also taught. Biology is also taught since kindergarten. The topic on science, animal planets, and environment are started to introduce at the level of grade 1-3. Geography, History, and Environmental impact are started to teach at the level of grade 4 and 5.

Teaching also includes for the psychological development of the students which cover the topics on facts for life, and psychology. The drama subject is started at the level of grade 5 till grade 11. Physical exercise session is also part of the whole curriculum. School health education topics include prevention of malaria and HIV, and avoidance of smoking and drugs. Since there is no specific instructor for exercise students are asked to help with environmental sanitation as part of the exercises.

At the grade 5th to grade 9th level method of making traditional snacks and foods are taught. Each student has to bring recipe for learning session on making snacks and traditional food. There are 6-10 sessions on this topic each year. It makes student and teachers more coordinated and get team spirit. The library is opened to all and students are allowed to borrow books as much as they can. Students believe that teachers could help solve not only on the subject but also on their family difficulties. Senior classes support the junior ones in solving different things that are being encountered daily at school.

6.2.3 Discipline and classroom management category

Checking attendance is done every day by teachers to monitor the attendance of students' participation in the classroom. Parents of the student who are absent without any reason are called upon to school office to discuss the problem. If a student does not come to school at all for five consecutive days the teacher concerned to visit his or her residence and ask for the reason and solve the problem. However, there is no rule to kick out the student from the school for any reason.

Students have difficulty to come to school because they have to walk down from their residences during rainy season. Seasonal influenza is a common health problem among many students during the rainy season and students used to be absent from school. Some parents migrate from other places for jobs like searching for oil and

making brick so that their children are occupied with the parent's tasks and miss classes many times. There is no kick out from the school even if the student is absent from school for one month. In that case parents are invited to the school office and discussed to send their children to school again.

If students do not obey their school discipline they are spanked and asked to make fatigue. Outstanding students who are good at a particular subject and those who help others are given prizes in the assembly. There is a big occasion every year where all outstanding students are praised and rewarded so as to make other students to envy them.

All lessons are usually taught completely at school and there is only little home work. There is a routine class examination every fortnight for grade 1 to 9 and a routine semester wise class examination for the grade 10 and 11. It helps get the success rate of 100% for all examination. Semester wise examination (for the first semester from June-Oct and for the second semester from Oct-Feb) support for the higher success rate in examination.

For the 11th grade that is last level before entering college, pretest is done in October after the complete class teaching from July to October. Second pretest is done in December and all the result is sent to Gangaw High School with trend of status in graph.

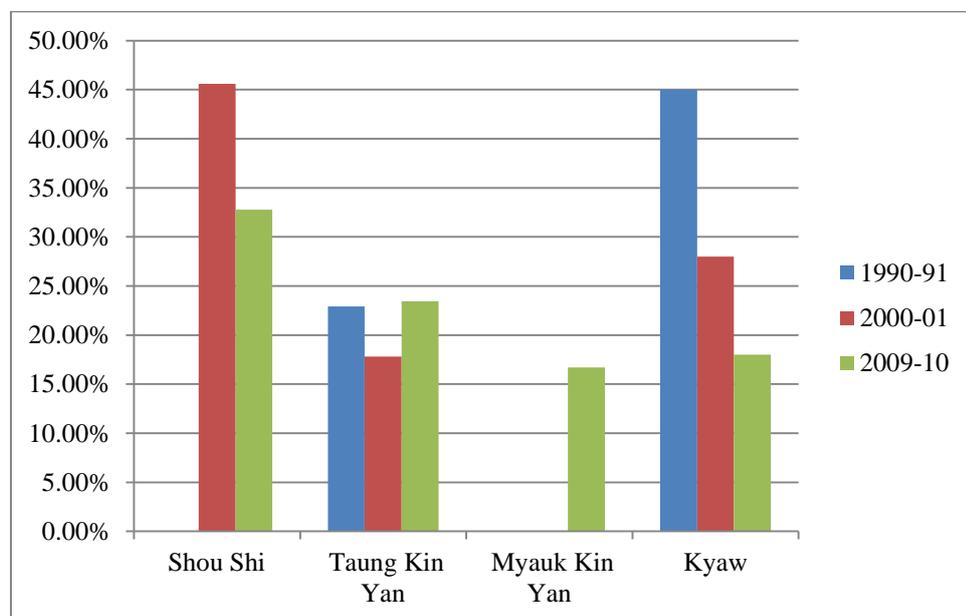


Figure-6.11: The success rate of grade 11examination in (4) study areas

As there was high turnover rate of teachers in Shon Shi High School during 1990-91 there was no data showing the success / failure rate of examination status. In 2000-01 the success rate was 45.59% and in 2009-10 32.77% (see Figure-6.11). Among 5 study villages Shon Shi village has higher rate of success than other villages.

In Myauk Kin Yan high school data for success rate was available only for 2009-2010. For the students of Myauk Kin Yan village there was no pass rate of grade 11th as there was no high school in Myauk Kin Yan before 1990. There was 45% success rate in 1990, in 2000 28% and in 2010 18% for grade 11th in Kyaw Village (see Figure-6.11). The reasons of declining trend might be due to no job opportunity after graduate from high school as well as even after graduation from the college and so students seemed not to work hard due to lack of motivation.

6.2.4 Attitude towards Schooling

Most students are happy to attend classes. They have different expectation in life. Some expect to become doctors, engineers, teachers and nurses. But some want to become monks. They think their expectations will be fulfilled after schooling. Students usually see teachers as their role models and like and pay respect to them as teachers show their sympathy for them and dedicate themselves to the students.

In all study villages, villagers were active and motivated to take part in school activities as they expect their children to become educated persons and contribute their skills in the village development work in future. But there are some graduate person in the village without any job. That is why some villagers do not want to send their children to school anymore. One 53 year old village man from Shon Shi said as follows:

“I saw some jobless graduate youths in some villages. Parents realize that even though they send their children to school is of no use for them. They think it is better to let girls acquire only primary level education and ask them to involve in different tasks within the village like animal breeding, harvesting and cultivation.

6.3 Socio-economic change due to media

Gangaw Township was once very hard to communicate as Pontaung and Ponnya mountain ranges were to be passed over to get there. Though post office and telecommunication have taken place in Kyaw region since 1964, communication was

much delayed due to bad transportation. In 1970, traveling had to be made by hiking, naturally being a region that was hard to travel. In 1973, Mandalay-Sagaing-Monywar-Gangaw-Hakhar road was completed, and then the transportation became smooth; after 1988, communication has been booming.

6.3.1 Environmental relationship

Railway construction began in 1996. Similarly, telephone lines were extended; Kyaw and Myauk Kin Yan villages used telephones in 1996-97(see Table-19). Since the start of the railway construction, all members of village authoritative organizations were officially allowed to use Icon phones that were communicable within 12 miles. For emergency meetings, the Icon phones were very useful to make contact with each other among the committee members then.

Table-19: Status of phone communication of the five study villages

Shon Shi Village		
1992	Dialing phone	
2005	062	(2)
2010-11	CDMA	
Zahaw Village		
2005	062	(1)
2010-11	062 (5); CDMA, Icon Phone	(15)
	(10)	
Taung Kin Yan Village		
2004	Dialing phone	(2)
2007	073	(4)
2010-11	IPStar (Satellite)(10); CDMA (3)	(13)
Myauk Kin Yan Village		
1996-97	Dialing phone (99)	(99)
1998	IPStar (Satellite)	(1)
2010	073(2); Dialing phone (3)	(5)
2011	073(5); IPStar (Satellite) (8)	(13)
Kyaw Village		
1996-97	Dialing phone (13)	(60)
2000	062(2)	(120)
2007-8	IPStar (4)	(110)
2010	CDMA	

Of the five villages in the study area, Shon Shi village began to use telephones since Gangaw started its telephone lines in 1992. Second earliest, Myauk Kin Yan and Kyaw villages were able to use telephones in 1996-97 when railway road had been initiated. After 2000, auto phones, satellite phones and CDMA phones have been in use. Zahaw and Taung Kin Yan villages began to use telephones in 2004-05, but CDMA phones were able to use only in 2010-11 (see Table-19).

In Gangaw, TV relay stations were set up in 2001. Due to the emergence of TV, video and good transportation, dealings and trading with other localities, and the flux of migrants, the practice of wearing traditional costumes disappeared right away. The traditional costume pattern for male (see Figure-6.12) consists of a turban, two piece longyi (Hnanansat) (နှစ်နံ့စပ်) coloured red, yellow and green and a spare longyi slinging across the body or a shawl covering the body, with a knife always taking place on the waist, regionally known as “dharkharchati”(ခါးခါးချပ်). It is because a knife needs to be always carried so as to use as necessary when traveling in the deep forest and jungles. A spare-longyi or a shawl was used to cover the body as the substitute of shirts because in olden days they had to weave themselves for their own clothing and thus there were no spare clothes. It is therefore women (see Figure-6.13) wore two pieces longyis (Hnanansat).

As per a 54 year old Kyaw villager, in the thingyan (water festival) days, throwing waters to each other (women and men) was a traditional practice, especially boys had to go to girls’ houses at 4.00 in the morning and pour water. The boys had to wake up early and had to be watered, went to bed again; and again had to wake up when the second group came and were to be ready to be watered; and thus the process went on. Boys also could go to the girls’ houses at night to pour water. But right now water throwing stages (mandats) (မဏ္ဍပ်) are set up and throw water. I think, it is because water becomes scarce right now. Worst of all is the change of clothing pattern; male and female alike wear jean pants and drink beer; the water festival nowadays is just like a rumbling of a doomsday. Such changes have been going on for three years.

As per the 58 year old Myauk Kin Yan villager, they had to go up to Gangaw and Kalay to make communication via telegram and mail. In 1996, there was no phone linkage here. My son applied for tutor post giving the address of Myauk Kin Yan village. The appointment was sent here: it was a bit late. At that time he was attending MRES (Master of Research) in Yangon. There was no phone to make contact with

him. We had to go up to Kalay and send the message. He also had got sores and ulcers while in Yangon, but there was no phone and we couldn't go to Yangon as well; such were miserable things caused by inconvenient communication!

As per the 53 year old Kyaw local villager, local products previously had to sell at Monywa, Mandalay and Pakokku. Now due to good communication and transportation, goods required are only to be made orders by phone, cash for goods to be transferred via buses plying regularly, and the goods required will be at home being carried along by that bus right away. Goods on credit are also available by phone, too, on credit system: pay for the old and get the new one. You don't need to go there by yourself: right at home you feel easy without missing any of your house work anymore. The commission for transfer of money is 1500 kyat per lakh. If you want to buy gold, they will buy it for you, too. Quite convenient!

Moreover, as per the 60 year old Myauk Kin Yan villager, before the availability of phone links, we did not have a chance to be aware of the flood invasion in Gangaw timely and so we had to suffer loss of cattle and the tractors were under water. In 2010, we got the phone message of flood twelve houses in advance when there was flood as we have already got phones in hand. Thus, we were able to escape from the disastrous flood without having much damage. Because of phones, we have a chance to know the current prices, causing convenience in marketing and trading. In the fields of social, health, and education, too, phones are of great help to us.



Figure (6.12): The traditional costume for male



figure (6.13): The traditional costume for female

6.3.2 Electricity

Communication in the area becomes much better. Attempts to get electricity had to be endeavoured so as to use TV and video regularly. In Shon Shi village, the electricity has been obtained through individual self-help system. Only about 30 households in Shon Shi village are accessible to Gangaw electricity. Half of the village households get electricity distributed by Youths association: 2000kyat per month for a two feet lamp; for village welfare: 7000 kyat for the funeral day and 3500 kyat per day for the remaining six days. The cash thus earned is used in buying pots and pans for use in village welfare activities.

In Zahaw village, individual hydro-electricity plant (see Figure-6.14) is giving light to the village, using Zahaw creek water power. The hydro-electricity power plant cost 7 lakhs, capable of using for five years. The timber used in constructing the power plant was teak and hardwood that had been locally extracted. The electricity is available for six months (November, December, January, February, March, April). There are two persons who produce hydro-electricity power plant. About 30 houses and pagodas in the village regularly get electricity from 5.00 to 10.00 pm: 2000 kyat for a two feet lamp per month, 5000 kyat per TV set/ month, giving electricity to 5 TV sets. Battery charging enterprise is also carried out. 300 kyat per battery charging, charging 20 batteries / day. An average income of 2.5 lakhs per month is earned from hydro-electricity enterprise. It is an attempt to upgrade the living standard of the village based on the environmental situations. In Taung Kin Yan village, there are two bio gas engine power plants.

One is the village-owned and the other is the private owned. The village-owned one was inaugurated in 2006, November-1. It has been established through the assistance loan by North West Command and the contribution of the villagers: 6000 kyat- 25000 kyat per household with the exemption of widow and widower households. The individual-owned one was inaugurated in May 1, 2007: during the rice milling period, electricity is transmitted at 20,000 kyat for IP Star (Satellite) Phones.

Village-owned power plant distributed electricity in 2007: 1000 kyat per two feet lamp/month for 180 households; in 2009, 1000 kyat per two feet lamp / month for 315 households (340 lamps); moreover, 3000 kyat per colour TV set for 61 sets / month, 1500 kyat per black and white TV set for 2 sets, 1000 kyat for a video hall/ month. In day time, village-owned bio-gas power plant mills rice on hire: 150 kyat per basket

(75 pounds) of rice (of charge), 85 baskets (6375pounds) /day. Rice husk ash is available free of charge for use of fertilizer.

In Myauk Kin Yan village, too, there are two private bio-gas power plants, (see Figure-6.15) distribution light to the village from 6.00 to 9.00 pm: 1500 kyat per two feet lamp/ month, 4000 kyat for video, 1300 kyat for a TV set. In winter, light distribution time is one hour earlier; and in summer, one hour later than usual time. In Kyaw region, private owned engine is used to distribute light: 1500 kyat per lamp / month. As Kyaw region is a prosperous commercial region, every roadside home is a shop and every home has a generator.



Figure (6.14): The hydro-electricity power plant using Zahaw creek water power



Figure (6.15): The bio gas engine power plants in Taung Kin Yan Village

6.3.3 Social sector

Previously, communication and road transportation in Gangaw region is hard blocking the process of dealing with other regions. Hiking was the only way to go from place to place sleep out. Therefore, the villagers are very helpful to each other, and thus “village crier” (Ywarzaw) (ရွာခေါင်း) has been created to make unusual incidents and village welfare issues known to the whole village.

The duty of a village crier is to inform the village elders whenever a guest arrives so that the guest’s requirements are to be fulfilled; to make villagers assembled in case of village affairs good or bad. Nowadays, the village crier has to invite villagers to attend meetings, to summon people to office appointments, and to collect money for bags of chemical fertilizer that were sold to local people per house / bag at a price of 24000 kyat per bag.

There were only one village crier in Taung Kin Yan and Myauk Kin Yan villages previously. After 1988, two village criers have been appointed. Due to the construction of the Taung Kin Yan dam, and the construction of railroad, the duties of village crier have increased. Construction of railroad and car roads demanded a great deal of labour of the villagers. As the participatory work increased so the responsibilities of village crier multiplied, sending messages to nearby villages and fulfilling the requirements of army forces at the same time.

In case of offering ceremonies, weddings and funerals in other villages, it is village crier’s duty to inform them how many persons are coming from his own village, how many are there who can eat one viss (1.63 kg) of curry or fifty ticals of curry one day in advance. A village crier is a person who facilitates between the villagers and village authorities, among the villages, in order to cooperate unitedly among the villagers and villages to accomplish all village activities. Being considered to be the leaders who are carrying out village welfare, village criers get exemption from cash contribution in every village affairs that need to contribute money.

Previously, four “pyis” (11.5pound) of paddy per house / year were to be collected to give to village crier. For those who were not famers, money equals to the value of four ‘pyis’ (11.5pounds) of paddy had to be contributed. Nowadays one basket of paddy (46 pounds) is to be collected. Some villages have to give 150-170 baskets (1basket = 46 pounds) of paddy to the village crier: there is the slight difference among villages. In Kyaw region, 2000 kyat per house is to be collected, the village

crier earning 6 to 7 lakhs per year. Village crier is appointed at least for one year, if agreed up to 4-5 years.

Village crier especially has to take the responsibility in cases of offering ceremonies and funerals, whereas village lads and ladies association, of weddings. In olden days, invitation was performed orally, but nowadays through invitation cards (see Figure-6.16) or presenting cigars, soaps, shirts or longyis. For offering ceremonies and funerals, oral invitation was previously used, at present both loudspeakers and invitation cards are used. Here is the sample invitation programme of the village crier-using loudspeaker. There are two types of invitation for donation ceremonies: “byo cry” (ဗျိုးဟစ်) (for all the villagers) and “selected cry”. The extol (verse) of the village crier in “byo cry” donation ceremonies is as follows:

“Attention, please! All the respectable laymen and laywomen! The Layman U ... and Laywomen Daw ... would like to invite all of you to the donation ceremony as follows:

To come to dinner on the night of the 2nd waxing, Tabaung, 1320 Myanmar Era. To listen to the sermon on the 3rd waxing. All of you are cordially invited to the donation hall, taking the hands of your sons, touching your husbands, closing the house with thorns (as there is no door at Yaw traditional houses, the branches of plum are put at the entrance of the house) (သားကိုလက်တွဲ၊လင်ကိုလက်တို့၊အိမ်ကိုဆူးဆို့) , addressing the chickens tee ... tee ... (ကြက်ကိုတီတီ) , the cat mee ... mee ... (ကြောင်ကိုမီမီ) , the dog ohh... ohh ... (ခွေးကိုအိုအို) , without leaving even the guests, including all the persons on the cart, in the stable (လှည်းနေလှေ့အောင်း၊မြင်းစောင်းမကျန်).” The village crier, it is observed, is inviting not only children, men and women and guests but also domestic pets to come and enjoy meals. Right now, any motorcycles needed to be used by the village crier are contributed free of charge in some villages so that communication be faster than ever.

Moreover, the village crier and fire fighters are responsible to search for suspected visitors, to inspect fire utilization and fire alarms. The forest fire usually starts from burning dry leaves so as to prevent mosquito bites when some of the villagers go to the East Yoma and the Chin Hills to gather forest products. To prevent these forest fires from intruding into the villages such preventive measures as cleaning the village environment, storing water for fire fighting, summoning one person per house are carried out under the guidance of firefighting association.



Figure (6.16): The invitation cards for offering ceremonies

Parahita association

There is the Parahita association in Kyaw village headed by the Youths founded in 2009 (21.9.2009). Membership entrance fee is 500 kyat with a total of 70 members. The roadside shops in the village are occasionally asked for donation. The association provides the following persons with service, cash, etc., accordingly:

1. Sanghas who are not sufficient for alms and other things;
2. Old ages who are poor and without supporters;
3. The poor children (donating materials needed in education); and
4. Funeral services

Monthly provision of 1000 kyat and 4 pyis (18.75 pound) of rice to 26 old ages in the village has been made. As per the 36 year old member of the Parahita association, a poor woman in the village had some problems in giving birth to the baby. Her husband was away from home at that time. We (member of Parahita) hired a car and sent her to the hospital. We provided her with all the expenses. We also hired houses for students who came to Kyaw village to attend school, providing them with necessary books, pencils, candles, etc. It is observed that there are some people who are willing to help the persons that are in great difficulty through humanitarian ground instead of drinking alcohol and wasting money in useless ways. Such positive attitudes and philanthropic concerns may lead to a peaceful and pleasant environmental scenario at last.

CHAPTER (7)

DISCUSSION

Cultural ecological approach was used in carrying out the research; A case study of Gangaw Township, in Myanmar. It was tried to observe the infrastructure, structure and superstructure in Gangaw Township. In doing so, both emic (native's point of view) and etic (observer's point of view) were included through using the methods of functionalism (functions interrelating with each other) and comparism (comparing among five study villages) and cultural materialism (A research strategy that focuses on technoenvironmental and economic factors as key determinants in sociocultural evolution).

When studying the five study villages in Gangaw region, the socio-cultural changes, environmental changes and their adaptability were emphasized dividing into four decades- 1970,1980,1990,2000,2010 (from 1962 to 2010). The main constraint in agriculture for Chin and Bamar (Yaw) nationals who live in this region is not getting enough water for agriculture. They however tried to solve this problem by creating hand-made dams and government dams. It therefore had to carry out the study based on parallel adaptation as there had been the development of similar cultural adaptation to similar environmental conditions by people of similar cultural background.

Moreover, by using the technology and knowledge based on intensive agriculture and locally available natural resources, there have been a great deal of changes – social organizational changes, economic changes, and belief system changes, etc.– through which the relationship between culture's impact on nature and nature's impact on culture were observed. The socio- cultural development of the nationals in Gangaw Township, thus, was observed in view of stability, modernity and education through culture ecological approach.

7.1 Population and environment

Gangaw was once a mountainous region, densely populated with forests and bamboo groves, and hard to communicate. Naturally, growing vegetables and fruit trees were staple food for those who lived in the region. Forests and deep jungles were important resources for food, especially in times of drought that caused crops damages and famines, providing people with forest produce which were also marketable.

Previously, the wild yam (Kywe-U), obtained from the forests was consumed as the rice substitute food in times of drought causing reduced rice production and insufficient local consumption. The wild yam is also consumed as dessert being processed with jaggery (Palm tree sweet, Htan-hlyet). It is said that the more there is drought, the more plentiful the wild yam is. The wild yam is drought-resistant (Myint, Tin, 1992).

For those who are adept at searching for forest products (especially women), forests provide them with such vegetables and food as tuber, buds and twigs, bamboo shoots, fruit and flowers, seeds, barks, etc. Other forest products, flora and fauna, could be sought and sold at the town markets for their living, too. Later, over-exploitation of these forest products caused the scarcity of some species and the extinction of some others. On the other hand, due to the construction of railroads and good communication and proper marketing, the local people are able to enlarge their scopes of knowledge, extending their business, and become prosperous.

Table-20: Roads and railway lines plying across Gangaw

<u>Car Roads</u>	<u>Car roads' miles plying Gangaw Region</u>
Gangaw - Mandalay	201 miles (2 cars daily)
Gangaw - Pakokku	145 miles (2 cars twice a week)
Gangaw - Nyaungbingyi	112 miles (4 cars daily)
Gangaw - Htilin-Kyanktu	76 miles (1 car)
Gangaw - Hakha	89 miles
Gangaw - Matupi	196 miles
<u>Railway lines</u>	<u>Railway lines' miles plying Gangaw Region</u>
Gangaw-Kalay	71.61 miles
Gangaw- Kalay- Yemyetni	105.61 miles (3 times a week)
Yemyetni-Kyaw	27.6 miles

Nowadays, it is quite easy to go to Mandalay from Gangaw all the time, and it is thus possible to travel all over the country via Mandalay. By railroad, it is possible to go to Kalay directly from Gangaw and Tamu via Kalay (see Table-20), buying consumer goods imported from India cheaply on the return journey. On the other hand, trees and

forests need to be cleared to introduce such good communication, causing loss of trees and forests. In some villages, even houses were lost due to construction of roads. Some small-scale farmers also lost their cultivated land areas causing them poorer and forcing some of them to leave their village. Due to poverty and social insecurity, such bad consequences as over-exploitation of natural resources increased again.

Regarding the utilization of water, it was stated in graph, figure 4.9. It was observed that Shon Shi and Zahaw villages used less wells rather than other villages although five villages in the study area used more wells during 1970 to 2011. The reason was that Shon Shi village stands near the Myithar river and Zahaw village on the bank of the Zahaw Creek, resulting in the availability of plentiful water for general use. After 2000, Taung Kin Yan, Myauk Kin Yan and Kyaw villages used more wells for water supply. After the construction of the Taung Kin Yan dam (1993-94), water being available at the depth of 20 feet – 30 feet and the development of agriculture in the locality, Taung Kin Yan and Myauk Kin Yan villages made digging wells, including deep tube wells, increased. In Kyaw region, too, due to good communication and transportation, and economic development, water wells (hand-made wells) just like oil wells could be dug a lot at a low cost after 2000.

7.2 Socio-demographic characteristics

When studying the population growth in Gangaw Township, not only birth mortality and prevalence of diseases but also changes during demographic behaviour were observed. Around 1980, mother and child mortality rate increased due to the practice of traditional child births. In Zahaw village, male under 18 years was 24.3% and female in that group was 27.1% in 1970. In 1980, the population of under 18 decreased half 10.71% for male, and 17.86% for female. In Kyaw village, there was 9.56% of male and 14.8% of female under 18 years old in 1970. In 1980, the population of under 18 increased up to 14% for male and 15.6% for female in 2010 due to good communication, trade booming, and a flux of migration from other regions.

Moreover, due to increase in childbirths, traditional contraception cases were observed. Birth control after marriage is depicted in Karnataka in rural South India. It is the utilization of one kind of traditional medicine. The village women, at least half a dozen of them, have knowledge of herbal abortifacient, usually acquired from her

mother, or a male herbalist who included such knowledge as one of his specialties. Such abortifacients were usually administered orally, and, within living memory, the demand was small. More importantly, there is consensus that such abortifacients were not used to limit family size. They were employed to hide the proof of sexual relations that should never have taken place: those before marriage and more frequently quoted by Hindus (Caldwell, John C. Reddy, P.H. Caldwell, Pat, 1982).

In Gangaw Region, concerning to increase in childbirths, one of the local herbal roots which are called "Taung-Kya Ott (*Stephania Venosa*) are also consumed mixed with local spirit (alcohol) to induce abortion (the colour of that root is reddish that look like blood). This is in fact done without letting any other know, in consultation with a traditional birth attendant. Some ensure abortion by taking this medicine without the knowledge of their husbands, especially done by those who have many children and are very poor.

In Gangaw region, official birth control was started to practise in 1990. Birth control has widely been done through the use of contraceptive injection, and pills, and inserting IUCD (intrauterine contraceptive device), etc. Birth spacing and contraception were thus observed as case study through in-depth interviews (IDI). Mothers who are not in good health and who are close in birth spacing, who have at least three children and one over 38 years old have to undergo contraception (contraceptive operation). Systematic birth spacing practices are very common right now due to official contraception and birth spacing activities by the government cheaply and awareness raising campaigns, causing decrease in childbirth rate.

Moreover, compared to other countries in the region, marriage in Myanmar occurs at a late age. Most adolescents (aged 15 to 19) are unmarried (UNFPA, 2010). In 2001, at ages 45-49, almost 12 percent of women had never married. For women aged 30-34, the percentage is 25.9. These proportions are considerably higher than found in other countries in Southeast and East Asia, even those considered to have late age at marriage (UNFPA, 2004).

In this study, it was observed that both women and men alike have late age marriage due to high bride price practice: for women aged 30 and for men aged 35. In addition, spinsters aged 45-49 live with their parents and family members without getting married any more. This study thus mentioned the relationship between demography and socio-culture.

7.3 Structure of economic activities

The principal occupation of the nationals who live in Gangaw region is agriculture based on intensive agriculture with domestic livestock breeding to some extent. Of the five study villages, Taung Kin Yan and Myauk Kin Yan villages have well developed through agriculture. Kyaw village have developed through trading. Shon Shi village and Zahaw village do not have government dams. So, these villages have developed to some extent. It is true on one hand that forest degradation is brought about due to the construction of dams. On the other hand, due to the construction of the Taung Kin Yan dam in the study area, farmland and Indaing land areas were transformed into paddy land areas, resulting in better yield and production of paddy and bringing about the higher living standard of the local people. Moreover, job opportunities were created due to the construction of dams providing villagers with such employments as supervisors of the canals and canal labourers, etc. Thus other income earning activities for the family along with agricultural farming are being carried out simultaneously.

Farming system in Gangaw Township

Among five study villages the signs of agriculture development were seen in Taung Kin Yan and Myauk Kin Yan. That was the result of the completeness of Taung Kin Yan Dam. Crop production becomes self-sufficient in Zahaw, Shon Shi and Kyaw areas just because of the presence of private small dams. As Kyaw area is not good for agricultural cultivation neighboring villagers come to the area and sell agricultural products for daily food. It was found that people in the Kyaw area are more interested in doing trading rather than working for agriculture.

Table- (21) Crops substitute in five study villages

Year	Crops substitute	Remark
1962-70	wheat	wheat special yield area
1962-88	butter bean	planned buying by Trade & Agriculture
1986-2009	sunflower	state policy to grow multiplier crop
1986-2010	ground nut	the most grown crop at present
1990-2010	watermelon	the most grown crop at present (Zahaw water melon: a well-know local product)

From 1962 to 1970, Gangaw Township was recognized as the wheat special yield area and the model wheat fields were irrigated (see Table-21). Later, heavy cost of cultivated water due to expensive water pumping costs and decreased yield per acre, butter bean was substituted in place of wheat. Butter bean was bought by the Trade Agriculture department.

Butter bean was the best product of the region at that time, not only selling in Monywa and Pakokku but also exporting to Japan as well. Later on, the Trade Agriculture did not purchase butter bean and thus the production decreased. Although wheat and butter beans used to be the product of Kyaw before few people continue to work for these items nowadays. In 1985-86, the state issued an instruction to grow sunflower as a multiple crop with other crops. They cultivate groundnut and sunflower after 1990 and they sell out these products in return of rice and household commodities. Water melon has been one of the famous local products of Zahaw village. As the communication and transportation had developed in this region, they started growing Taiawan watermelon Species (from Mandalay) in Zahaw village in 1990. In 1991-92, sunflower was grown a great deal; but in 2008-09, wild parrots in groups destroyed sunflower harvest. As a result groundnut and water melon become the sown crops in the area (see Table-21). Owing to growing groundnut in the five study villages, such improvements as building corrugated iron roofed houses and buying TV, Video sets, etc, have been apparent in the region, changing the living style a great deal of the local people. It was found out that people had got a great deal of advantages by growing watermelon and groundnut because it had increased up to commercial level.

Water irrigation becomes an important factor for agriculture development in developing countries. In the finding of Dove Micheal R & Carpenter Carol (2008) local people in Moroccan village of Chicago worked individually on water irrigation as personal ownership of water instead of group activity. Most land was cultivated with irrigated water as there were few rivers and streams compared to other areas. People just depended on rain water. Water irrigation was done by order of succession. For example the first field was supported for water irrigation and then switched to other field till all fields got support. Then water support came back to the first field. The water support depended on availability of water. There were no organized structure, committee, tax, person with full authority and so forth. They just did on

their own decision to complete water irrigation such as opening the door of canal and safeguarding the drains in good condition etc. The owner hired labors to work for that. In this study similar pattern of water irrigating cultivation was found in Zahaw and Kyaw where hand-made dam was applied. In Taung Kin Yan and Myauk Kin Yan where government dams exist water irrigating cultivation is implemented through organizational structures with rules and guidelines to make more systematic. It means water irrigating is done with roster for all villages nearby. The process is accomplished through a series of official meeting among farmers and authority and with some taxation for that. Inspector and cleaners for water canal, water pump and the entrance are appointed. Due to the systematic water irrigation for cultivation Taung Kin Yan and Myauk Kin Yan villages become more economically developed. People are now using tractors and threshers which help timely harvesting to avoid any unnecessary lost and damage from unforeseeable heavy rain. It was found out that two third of the villagers in Myauk Kin Yan village were using tractors and threshers. Moreover, in the FAO report (2003) agriculture system and ecosystem approach was investigated in Naw village of western Iran. It showed that agriculture depends and originate from the natural resources and the situation of environment (soil type and environment management). Farmers in those villages used animal dung as fertilizers instead of artificial ones and there was no sign of development in technical knowhow. The utilization of chemical fertilizer, pesticides, herbicides, and fungicides could not systematically be used in these study areas. It was found that laborers from Chin Hill were hired as occasional seasonal migrant laborers for many days to harvest the crop for want of quick harvest to avoid any loss caused by incoming severe weather. These laborers are given accommodation at their own houses including meals. Basic infrastructure has been developed since the railway road was completely constructed. As the communication and the water supply from the dam are better people cultivate more crops which need abundant of water like ground nut and paddy Pawsan variety. Due to better coordination and cooperation with agriculture department, people are now cultivating three varieties of ground nut and those of new varieties that produce more cooking oil. In this study, it was found that traditional way of recruiting labor such as 'Arsogine' and volunteering for others reciprocated in agriculture activities. Indigenous agriculture system and environmental manipulation was also explored in this study.

The landuse pattern of Taung Kin Yan and Myauk Kin Yan villages are shown in Figure 5.7 and Figure 5.8. As there is no fallow land to make room for farms in Taung Kin Yan village, farmland areas are transformed into paddy land areas, and yield per acre is promoted through irrigation. As a result, paddy land area has increased and farmland area has decreased in 2010. But there is a lot of fallow land to make room for farms in Myauk Kin Yan village; thus both the paddy land area and farmland area have increased in Myauk Kin Yan village in 2010.

Animal husbandry

In Wapishana village of North-East of South America, of the domestic animals, cows, pigs and chickens– the latter generally being raised for the production of meat rather than eggs, although eggs are also eaten–are the most important as sources of meat. Horse, donkeys, cats and dogs are not eaten and the other species listed above are fairly uncommon. Horses and donkeys are used as draft animals and for transportation: horses particularly in the location and rounding up of cows. Cows are also put to work--to carry heavy loads, or as a means of transport when ridden or used to pull bullock-carts. (Henfrey, Thomas B, 2002). Therefore, only the semi-structured interview was employed and social environment was not considered in this documentation.

In Gangaw Township, the main animal of husbandry is cow. The figures (5.36, 37, 38, 39 and 5.44) showed decreasing trend of buffalo husbandry because buffalo needs a wide area of grazing ground and pond. Moreover, there is the scarcity of pasture land because virgin land areas are cleared for farming in the years. People do cow and buffalo husbandry to be utilized for agriculture and for pulling wood and bamboo. Two third of people do not use them for meat as these animals are identified as master of livelihood. Thus people mostly buried them when they died. Moreover, cattle are exempt from being killed and eaten, considering in the long run their existence and sustainability may help improve the living standard of the society.

There is no systematic breeding of chicken and pigs yet. These animals are bred not only for meat but also for essential contribute during special occasion like wedding ceremony as symbol. The family of expected bridegroom breeds pigs to be utilized for forthcoming wedding because the family of bridegroom needs to offer pigs to bride for bride price. Moreover ritual ceremony is held by offering chicken to spirit (*Nat*) as

worshipping to wish for the protection of bride and bridegroom in the future. Horse husbandry is also done for riding and helping during ceremony like Novice ceremony. This finding highlights relation between husbandry and social environment. Continued application of ideology, technical know-how and ongoing utilization of available resources in the area may support people for livelihood situation in the socio-economic environment.

Self sufficiency and the market in Gangaw Township

Traditional weaving, once a prominent handcraft in the study area, is now almost on the verge of extinction. Only a few traditional weavers could be found out in Shon Shi and Zahaw villages where Chin nationals live together with the local people. In previous days, every house where there was a girl usually kept a weaving loom. Grown up girls now used to learn modern tailoring, leaving weaving industry motionless.

There was only a firewood-saving stove maker in Taung Kin Yan village. Stove-making is a kind of handicraft. It is true that using this kind of stove is actually fuel wood-saving. However, only a few villages near Taung Kin Yan village are accessible to such stoves. The existence of more and more fuelwood-saving stove makers should be encouraged for effective forest conservation campaign. Moreover, lack of capital money to buy such raw materials as empty barrels at the oil fields is a constraint in producing fuel wood-saving stoves.

The topic of Trading in the Economic Chapter of "Yaw" was not mentioned specifically for the period before 1970. Green Pea and Butter Bean was major product of Yaw Area during that period. Japan bought Butter Bean of Yaw area as much as it was produced. There was no agent or broker to perform this trade. The Agriculture Department performed this trade to export butter bean to Japan. But the business was very little as the transport was not favorable. (Kyar Tun, 1971)

There were only three small groceries by the time of the road construction between Pale and Gangaw that was started in 1962 and finished in 1968. There were a few customers too. Most vendors opened the grocery for short period as they also had to involve in agriculture activities. There was the once for 5 days market place where the products of farm and crops and home made products were sold. In addition to that the product of forestry like honey, thanakha (*Limoniaacidissima*), resin (obtained from

resinous wood; *Dipterocarpus Tuberculatus*), and meat of forest animals like rabbit, wild boar, partridge, antler, barking deer were sold by vendors there. These memoirs of daily life were illustrated in the book of Tin Myint (1990) which reflects Yaw's Lifestyles.

There are some factors which made more people to immigrate the Kyaw Area. Those are (i) to complete construction of road between Monywa-Pale-Gangaw during 1962-1968 (ii) to complete building of railway during 1994 and 1999 (iii) to work in oil well near Kyaw area (iv) to involve in construction project of the Heavy Defense Industry in the area which is 20 miles away from the Kyaw-area during 2008-2010. So, the increasing number of home groceries during 1970-2010 was mentioned as figure 5.68. In Kyaw village, a total of three home groceries were opened in 1970; and in 2010, it has increased up to 70 groceries. Six case studies in 5 sampled villages were done to explore benefit and loss of trading system due to infrastructure development within Gangaw area. Three separate case studies in Kyaw village were also done where development of trading system took place very significantly. Case study 1 and 2 depict the trading benefit and the case study 3 mentions loss in the business.

As Kyaw area has better communication and transportation, other related business activities become popular. Some people start involving in road construction not only in their locality but also in other places such as Namsan railroad construction. Some people who deals with forest related activities become successful. About 10% of the farmers become poor when they sold out their farm land and invest in oil-well business. Most farmers become successful with oil-well related jobs. Due to the construction of road and railroad, the products in Gangaw Township are not only sold within the local areas but also exported to China, Japan – etc via Mandalay and Yangon.

7.4 Family structure

In Gangaw region, both Myanmar nationals and Chin nationals use to live in unison and their settlement patterns are just the same. Traditionally they used to build houses, with tall posts, raised above the ground. Under their houses they raise cattle, pigs, ducks and fowls that can still be seen even today, hindering the availability and flow of fresh air and clean environment in the vicinity of the house. In building houses, no

windowpanes were attached to the doors and windows. So far to date, we can still see some houses with doors and windows without windowpanes in some villages in the region. The nationals are so good in character that the gates and doors are not necessary to be installed. Furthermore, they are so honest and kind-hearted to help each other in times of crisis and need.

The traditional custom of Chin nationals who live in that region was originally patrilineal descent system, practising patrilocal residence system. But having taken up residence in Gangaw region, they happen to accept as the relatives' member from both paternal side and maternal side. The "bilocal residence system," the system that allows husband and wife to reside where economic condition is favourable, is practised. However, the system that the youngest son inherits the 'house' is still being activated. Moreover, Chin nationals and Myanmar living in Gangaw region have the right of getting married with each other, and the families practise Myanmar (Yaw Region) traditional customs.

When decisions on household affairs are to be made, the father (head of the household) never makes the decision alone; instead, he always consults his wife and children. The mother usually takes the responsibility for the management of the household income. In the Asho-Chin patrilineal joint families, making decisions to pay for the expenses from the family 'central fund' seems to be autocratic. The wife and children ask for their own expenses from the central fund only in times of crisis (Nyunt Nyunt Win, 1994-96).

Though the households in Gangaw region allocate central fund and distribute among others, it is not autocratic at all. The households in the area practise the extended family system and the wife has to manage the family expenditure. However, the actual expenses of the household are controlled and agreed upon by husband and wife together. At the present time, economic extensions have taken place in the region due to improved transportation and communication, increased yield in farm products because of building dams and the emergence of local oil extraction sites. Nevertheless, father as well as grown-up children have to submit all their income earnings to mother. It is therefore obvious that the traditional custom is still being practiced. The observation here is that the household pattern has been based on the ethical code of conduct rather than the interest of individual family members: parents, sons and daughters, and sisters and brothers.

7.5 The analytical approach to educational status

The chronology of establishment of different category of schools in study villages was mentioned. Villagers put many efforts in starting and opening of new schools and promotion into the higher category school in collaboration with local authorities. The data also depicted the ratio of students and teachers in different villages.

The high school could be opened and established in Shon Shi, Taung Kin Yan, Myauk Kin Yan and Kyaw villages. In Shon Shi village the ratio between teachers and students were compatible (high school teachers = 14 and students= 119). But there was no compatible ratio between teachers and students in Taung Kin Yan and Myauk Kin Yan. Actually, in grade 11, the 'matriculation', there are six subjects for arts combination and six for science combination. It is, therefore, natural that there must be at least 12 teachers if there is at least on student for arts and one for science attending school. During 2009 and 2010 education fiscal year the ratio was acceptable in Kyaw village where there were 34 high school teachers and 99 students.

The examination for the 11th grade is of national level and so local students have to compete with others who have better educational facilities. In fact the teachers for the grade 10 and 11 need at least 12 qualified graduate teachers but that was not a case in the study villages. That might be one of the reasons for the decline in success rate in the final examination of the 11th grade. The trend was shown in Figure (6.11).

Parents think that graduate from high school and college do not make profit for the families compared to investing children in family's daily jobs starting from the childhood such as teaching children to drive car or performing as conductors, searching forest products to sell, and involving in finding out oil. Children also are interested in money making jobs rather than going to school.

7.6 Presence of television and communication

In the literature", the links and changes between the impacts of TV, Video and advertisements and the attitudinal changes of some children and the influence of alien cultures in place of traditional customs have been mentioned. In this study, the analysis is given to such cultural changes as the loss of time to make friends and love to each other for lads and ladies, the disappearance of wearing traditional costumes practice, the emergence of undesirable culture of other countries during the water festival, and drinking beer by boys and girls alike.

In olden days, going a courting to village ladies by lads in groups in the evenings in the off-time of farm work was quite common. While the village ladies were busy with their weaving and entertaining the lads at the same time, the visitor lads were busy assisting in the work of the village ladies. In those days, it was quite common to build

fires to get light as well as warmth. Nowadays, hydroelectricity, bio-gas electricity and generators are used to get light. As a result, video halls emerged; the practice of going a courting has already disappeared. Lads and ladies meet with each other at video halls. The charge per video show is 50 kyat per head; for two video shows only 100 kyat. So they spend the whole night there if the video shows are their likes, causing the total disappearance of going a courting.

Moreover, due to good and convenient communication, timely awareness before disasters such as floods and storms makes it possible to harvest and store farm products in time, to protect men and cattle from disasters beforehand, and thus it has become a great help for economic development.

Thus, not only such media as post office, telegram, phone, and TV, Video, but also the role of village criers who have been serving for the convenience of social and welfare of village activities has been of great importance from then on. The village criers have served for the convenience of the village through sending letters and messages since the olden days. The topography of the region was naturally hard to communicate, so the village criers thus took the important role, hiking from place to place. After that, loudspeakers were used to communicate in place of hiking. Nowadays, motorcycles are being used as necessary, and icon phones are of great help for social and economic development.

To serve for the development of village welfare activities in Kyaw region, not only village crier and Youths association, the Parahita youth association is also organized to carry out village development activities. With the increase in educated youths, dealing with other localities has multiplied and the youths have obtained wide range of knowledge. The Parahita association has been providing the old age villagers, poor children for their education and health development, etc, accordingly. Forming those philanthropic Parahita associations and contributing help in the village welfare activities, to some extent, is a very important endeavor for the development of the whole region.

Thus, as the villagers in the study area have gained stable peace and development, even the people from other localities have migrated to the region. 50% of the total population of Taung Kin Yan and Myauk Kin Yan are migrants who have migrated to these villages where agriculture has been well developed. In Kyaw region, 70% of the total population are migrants in 2010. All the villagers, in fact, will be in a stable and convenient existence only when the village environment where they have been living is in good order. With such prospective and positive characteristic as loving kindness, passion, delight, etc., the villagers are trying to overcome poverty and obstacles, giving helpful assistance to each other.

CHAPTER (8)

CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The development of infrastructure – highway roads, dams, bridges, etc., that is essential for the economic development of a country– is likely to cause natural environment deterioration on the other hand. It is therefore advisable to lay down socio-economic plans and start implementation activities in trying to construct essential infrastructure for the development of the nation, taking things into great consideration from different points of view in order not to deteriorate the natural environment, with least ruination, if possible.

Due to such construction activities in the locality as car road construction, railroad and railway tunnel construction, it is true that local people had to suffer a lot; on the other hand, it can be proved that it is quite advantageous to them. To be able to carry out such development activities, however, a great deal of labour of the local people had to be contributed and even houses were lost. In this, human rights, viewing from humanitarian ground, should be considered and recognized for the commitment and sufferings the local people had already made and experienced at the construction work sites such as insufficient food intakes, scarcity of drinking water, prevalence of health problems and even death cases due to negligence of building makeshift shelters for the labourers who had to work in places quite far away from the villages.

Roads and bridges in the area are often damaged by heavy weight of trucks loaded with logs and goods, passenger cars, etc., and by the natural springs, too. Of the five study villages, Shon Shi and Zahaw villages are least developed ones though quite close to Gangaw. It is because of the only existence of the Myitthar suspension bridge to cross the Myitthar River; instead, a more reliable and stronger bridge will make the region more convenient and developed.

In addition, as there are very many migrants coming in, so marriage events of the local persons with migrants are also increased: nearly half of the marriage events. There have also been villagers who have already moved to other localities as they have enough wealth or enough education, making population growth even.

Another thing is that child mortality rate in the study area has increased due to abortive measures, traditional childbirth practices, and birth control activities. Now,

systematic birth spacing practices have been carried out: generally taking only three children. Owing to systematic childbirth and vaccination by village doctors and midwives, child mortality rate has decreased, causing population growth regular. Bride price, a traditional custom in Gangaw region, becomes higher and higher, leading to late marriage for both males and females: and this is one of the reasons that hinder local people to over-population.

Kyaw village, too, has a great deal of business potentials, and thus a flux of migrant workers has rushed in, and in 2010, the migrant multiplied. On the other hand, natural resources, forests and trees in the region were damaged owing to a number of migrants. Over-population and behavioural changes of social organization are the main reasons for the extinction of biodiversity, flora and fauna.

In economic sector, intensive agriculture is the main occupation in the five study villages. Of the five study villages, Taung Kin Yan village where the Taung Kin Yan dam is located and Myauk Kin Yan village have improved a lot in agriculture. In Taung Kin Yan and Myauk Kin Yan villages where systematic irrigation can be practised, such worms and insects as shellfish, earthworm, frogs and the small mina bird (Satyet), etc., that are friends to farmers are often killed due to the utilization of chemical pesticides, herbicides, insecticides, fungicides apart from natural fertilizers. The death of these small creatures annually causes more pest incidents. It must be cautious about using more pesticides that also kills friendly creatures, and harms cattle and humans who eat the crops and vegetables being sprayed by pesticides. Though it is supposed that machines have been in use in agriculture, 70% of them have still been in use of cattle labour. So cattle are main domestic pets for their living. As a result, the old ages abstain from eating beef viewing the cattle as their benefactors. Fowls are mostly bred livestock in the region. They feed on worms and insects themselves in the house compound without having to buy fodder for them. They are also essential to be used in traditional religious offerings.

Weaving activities were prevalent in the study area before. But among five study areas a few people in Shon Shi and Zahaw where chin nationals reside are now doing weaving activities. Public awareness on weaving in the area and promotion it as local commercial product with the support of local authority may be important component for this purpose.

In Kyaw village, within the significant social and cultural attributes, the society has extended its traditional trading systems keeping abreast of international trading

systems just like Mandalay and Yangon, networking necessary trading methods and resources. Retail sales, increase in labour charges, development of companies and boost in trading portfolio has resulted firmly in higher standard of living in the field of economy.

In the social sector, In line with the development of the locality, household income happens to increase and thus economic management becomes complicated. Increase in per capita income and household income may assist the development of the locality. The Chin nationals who reside in the region have changed their cultural attitudes and manners and adapted Bamar (Yaw Region) traditional customs accordingly. The study thus attempted to emphasize on the household structural problems, their personalities, change of pattern in the production system and kinship phenomena to understand the socioeconomic atmosphere of the region.

Good communication and transportation, boom in business portfolios, establishment of state high schools, and affiliated high schools in education sector are obvious development activities. But there are no longer enough high school teachers in Taung Kin Yan and Myauk Kin Yan affiliated high schools. After 2000, school enrollment rate and pass rate have decreased, showing a decrease in education. The reason is that there are a great deal of fields in the area money can easily be made and another thing is the result of unemployment being committed to a large number of graduates.

High life expectations for educated persons regarding their job opportunities should be highlighted. Particularly the graduate youths should be guaranteed with appropriate jobs in line with their capacity learnt and accumulated at their respective universities. This in turn will make the local people know the impact of being an educated person, thus resulting in the encouragement of their children's education more than ever.

Along with the use of electricity, the impact of TV, Videos causes the influence of alien culture, affecting traditional culture at the same time. During the traditional thingyan festival, even the girls drink beer and take part shamelessly in the festival. As the communication has developed in the region, the postal service and the telegraph have also developed. In addition, natural disasters such as floods and their consequences like losing human lives and animals and the destruction of belongings are effectively prevented. Due to the installation and use of village bio-gas plants and hydro-power plants as well as private generators, villagers don't need to use oil lamps for light, to build fire to get warmth as well as light in winter. It is thus regarded as the environmental conservation by reducing the use of firewood and thus conserving the

trees and forests as well. Moreover, Guidelines to grow trees (three teak trees) per household, and to utilize fuel wood as per the principles set forth are now have been arranged.

Due to the improvement and development of mass media, the local people had gained a lot of knowledge on how to face and overcome the natural disaster breakouts in times of emergency. Such improvement of knowledge and awareness is a proof of convenient development of mass media resulting in the potentiality of knowledge sharing and willingness of the local people themselves to practise the communication techniques.

Some youths are educated persons, and by dealing with other localities, they have accumulated some good knowledge and lessons, and again established Parahita Associations, and thus has been trying for the development of their region of their own volition. It is a good characteristic and the best of good omens for the development of the region.

8.2 Recommendations

It is quite obvious that poverty has to be reduced through infrastructure development. On the other hand, the reduction of natural environment deterioration and ecological degradation is essential for each and every accountable citizen, organization and government. All in all, the well-balanced development and conservation activities between human development and ecological conservation should be emphasized, leading to eco-efficiency, and improvement of the socio-economic life of the entire human society in a sustainable way.

Moreover, top priority should be given to human rights and the rights of the labourers in the region as soon as development projects are initiated without affecting the social, economic, and educational efficacy of the local communities. The government as well as the non-governmental organizations (NGOs) should collaborately conduct propagation and awareness raising activities on systematic exploitation and extraction of natural resources and biodiversities in a suitable manner fighting against the practice of over-exploitation of these resources caused by over-population and customary changes of native people in the region.

The local authorities should particularly carry out educational programs through holding seminars and distributing pamphlets and handouts on systematic and

sustainable extraction of natural resources in the region so that the school children and the local people become aware of the importance of conservation of such natural resources.

The awareness raising activities should be promoted to increase the knowledge of the local farmers on the systematic use of pesticides, herbicides, and fungicides to avoid damaging beneficial insects such as mollusc, earthworm, frogs and myna, and the systematic use of chemical fertilizers reducing the misuse incidents of these fertilizers. It also needs collaboration among the Ministry of Agriculture, local authorities, NGOs and private entrepreneurs who merchandise chemicals and chemical fertilizers.

It is therefore needed to raise awareness campaigns on selecting good variety seeds and on attaining enough water for the development of agriculture. Furthermore, it is also necessary to value and conserve the traditional culture of national groups, and their traditional practice and local expertise on land reclamation. In agriculture, it needs to create equal rights based on the creativity proposed by the farmers themselves.

In the field of livestock breeding, it is also necessary to conduct awareness raising activities so as not to keep livestock especially pigs and fowls in the surroundings of the houses as the prevalence of diseases might take place in this way. The local authorities at Township and Division levels, should be advocated to start training programs on systematic livestock breeding for the local youths and local people.

Traditional weaving industry, a positive aspect of indigenous culture that also requires to get support from UN agencies and NGOs, should be conserved through awareness raising training programmes. Those who are currently practising weaving activities should earnestly be provided with necessary supplies and skills.

Forest conservation would be sustained through reducing the use of firewood in the study area, to protect degradation of trees and forests in the surrounding areas. Therefore, the urgent need to be fulfilled by the local authorities is to provide the fuelwood-saving stove makers with necessary inputs and awareness raising training programmes so that they will be able to produce more fuelwood-saving stoves and the local people will easily be accessible to these fuelwood-saving stoves as well.

In the education sector, adequate numbers of teacher should be appointed. Teachers (except Kyaw and Shon Shi State High Schools) in the remaining two study villages, Taung Kin Yan and Myauk Kin Yan villages are required to have teacher-student

ratio. Local authorities should emphasize on the educational development of respective villages. The government should also appoint more teachers at the high school level with the support of community. Policy makers need to allocate more funds for schools, hospitals, and health centres through upgrading them, appointing enough staff, etc.

Regarding Research Methodology, all-season field trips to research areas in such kind of research should be conducted. Moreover, it is recommended that 'quantitative research method' should also be done for more precision of data and information in such type of research in future. Certain parts of the data could not be studied in detail although the environmental transformation during 1962 to 2010 could be reconstructed.

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5. Government Offices

Communication, Post and Telecommunication= () nos Hospital= () nos

Dispensary= () nos

RHC= () nos

Police station= () nos

others = () nos

6. Education

S.H.S= () nos

S.M.S= () nos

S.P.S= () nos

Graduate= () heads

7. Mass Media

Video Hall= () nos

TV= () sets

Radio= () nos

Cassette= () nos

Dish owner = () nos

Computer shop= () nos

Others= ()

8 Religion

Pagoda/ Image= () nos

Monastery= () nos

Monk= () heads

Buddhist= () heads

Church= () nos

Christian= () heads

Pastor= () heads

Others= ()

